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103-93351-120610 Transmittal.Docx

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REPORT

FINAL DATA REPORT

REMEDIAL INVESTIGATION, OPERABLE UNIT 3 OF THE LIBBY ASBESTOS SUPERFUND SITE, PHASE III: Summer 2009 Small Mammal Data Collection Program

Submitted To: Remedium Group, Inc.
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Memphis, TN 38119

Submitted By: Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 USA

December 2010

Project No. 103-93351.001

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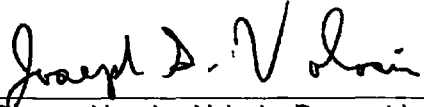
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APPROVALS

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned.



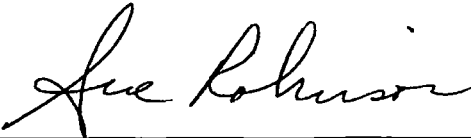
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ACRONYMS AND ABBREVIATIONS

AVMA	American Veterinary Medical Association
DQO	data quality objective
FSDS	field sample data sheet
GI	gastrointestinal
IACUC	Institutional Animal Care and Use Committee
LA	Libby amphibole
OU	Operable Unit
OU3	Operable Unit 3
PERL	Parametrix Environmental Research Laboratory
RI/FS	remedial investigation/feasibility study
SAP	sampling and analysis plan
SOP	standard operating procedure
USEPA	United States Environmental Protection Agency
WRS	Wilcoxon rank sum

EXECUTIVE SUMMARY

A data collection program for small mammals to be completed in the late summer of 2009 was described in the Phase III Sampling and Analysis Plan (SAP) prepared by the United States Environmental Protection Agency (USEPA) as part of the Phase III Remedial Investigation/Feasibility Study (RI/FS) conducted at Operable Unit 3 (OU3) of the Libby Asbestos Superfund Site, Libby, Montana (USEPA 2009a). Operable Unit 3 of the Libby site includes the property in and around the former open pit vermiculite mine that is located approximately 10 miles northeast of the community of Libby. This data report contains the methods, procedures, and findings resulting from the summer 2009 small mammal data collection program.

The Data Quality Objective of the summer 2009 small mammal sampling program was to determine whether individual mammals occurring in forested areas around the mine site within an area of the highest measured Libby Amphibole (LA) concentrations (i.e., a polygon-shaped area bounded by the highest LA sample concentration data for duff) exhibit a higher incidence and severity of histological lesions in targeted tissues¹, and/or gross deformities, relative to the small mammals collected from suitably distant (>5 miles) reference locations located upwind of the Libby site (USEPA 2009a). A secondary objective, conditional on the finding that significant histological effects were occurring in animals from the contaminated area, was to confirm LA exposure in animals by measuring LA in samples of harvested target tissues from both OU3 and the reference area in Kootenai National Forest. The latter data would only be collected if, based on the results of this study, it was necessary to determine whether observed histological effects were attributable to LA exposure (USEPA 2009a).

The small mammal species targeted for tissue collection have a small home range, forage on the ground, and have a small body weight to ensure representation of highly-exposed individuals, and thus maximize the potential to observe histological lesions associated with asbestos exposure. The two species targeted for tissue collection were the deer mouse (*Peromyscus maniculatus*) and the southern red-backed vole (*Clethrionomys gapperi*). A total of 30 animals per species per location (OU3, reference sites) were desired, for a total of 120 animals. Equal numbers of males and females were desired to the extent possible. Both species were identified as being the most common ground-foraging small mammals in Lincoln County (USEPA 2009a). Small mammal field collection (live animals), euthanasia, necropsy, tissue harvesting, and histological examinations were all conducted under approved scientific collection permit requirements, approved Institutional Animal Care and Use Committee (IACUC) (MDFWP 2009) and American Veterinary Medical Association (AVMA) procedures, and in accordance with Phase III SAP procedures and Standard Operating Procedures (SOPs) (USEPA 2009a,b). Histological examinations were conducted by a Board Certified Veterinary Pathologist.

¹ Five target tissues were harvested from all animals: larynx, thyroid; complete gastrointestinal (GI) tract (esophagus, stomach, small intestine, and large intestine), complete pulmonary tract (trachea, bronchi, lungs); and adrenal glands. Lesions in non-target tissues were harvested for histology if gross lesions were observed.

The following findings/conclusions are identified from the data collected in this study:

- Target animals captured included only deer mice. Southern red-backed voles were not captured at any of the reference or OU3 trapping locations.
- A total of 72 mice were collected, including 34 from the reference site and 38 from OU3.
- Mouse necropsies and target tissue harvesting were completed according to the Phase III SAP procedures and SOPs (USEPA 2009a,b) without incident, though a larynx and thyroid from one reference animal were lost during necropsy.
- Mice were in good health and no deformities were observed in any mice. A number of mice exhibited active or past parasitic bot fly infections. Several macroscopic liver lesions from OU3 mice were submitted for identification and one spleen was also submitted from an OU3 mouse.
- The overall female-to-male ratio for the animals captured from the reference area was 1.8. Conversely, there were more males overall at OU3 and the female-to-male ratio for captured animals was 0.8. However, sex ratios between transects were variable at both the reference area and at OU3.
- Based on the average dry eye lens weights, average mouse ages by transect ranged from 96 to 316 days (three to over ten months in age).
- Histological examination by a board certified veterinary pathologist found no evidence of asbestos pathology in any target tissues or submitted lesions.
- All observed tissue lesions, including those identified herein as occurring at a statistically significantly higher rate in OU3 mice, were attributed to parasite- and disease-related inflammation.
- The pathologist indicated that all mice had recognizable or exuberant fat stores, indicative of adequate nutritional status. None of the mice had evidence of a prominent stress response in the lymphoid tissues or the adrenals examined. The pathologist further concluded that within the confines of the study design and tissues examined, the lesions observed would not alter the general health status, growth, survival or reproductive abilities of the study mice.

The findings from this study indicate that no asbestos-related pathology was observed in mice considered highly exposed and collected from locations near the highest measured asbestos dust concentrations at OU3. The data collected in this study are sufficient to meet the identified Data Quality Objectives for the Small Mammal Study described in the Phase III SAP and Standard Operating Procedures (USEPA 2009a,b) and therefore, no further small mammal data collection is needed unless additional Data Quality Objectives are identified for completion of the baseline ecological risk assessment in support of an informed risk-based management decision.

1.0 INTRODUCTION

1.1 Purpose and Scope

This report and appendices document small mammal data collected during the summer of 2009 in accordance with the Phase III Sampling and Analysis Plan (SAP) prepared by the United States Environmental Protection Agency (USEPA) (USEPA 2009a,b) to determine if the data quality objectives (DQOs) have been met or if additional data collection is needed.

The Phase III small mammal data were collected to support the Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 3 (OU3) of the Libby Asbestos Superfund Site, Libby, Montana. The OU3 includes the property in and around the former open pit vermiculite mine that is located just above 2,000 ft elevation and approximately 10 miles northeast of the city of Libby (latitude 48.388N and longitude -115.555W).

The DQO of the summer 2009 small mammal sampling program was to determine whether individual mammals occurring in forested areas around the mine site with the highest measured Libby Amphibole (LA) asbestos concentrations (i.e., a polygon-shaped area bounded by the highest duff concentrations of LA) exhibit a higher incidence and severity of asbestos-related histological² and/or gross deformities relative to the small mammals collected from reference locations in the Kootenai National Forest. A secondary objective, conditional on the finding that significant histological effects are occurring in animals from the contaminated area, was to confirm LA exposure in animals by measuring LA in samples of harvested target tissues from both OU3 and the reference area. The latter data would only be collected if, based on the results of this study, it was necessary to determine whether the observed histological effects were attributable to LA exposure.

1.2 Document Organization

This data report provides the sampling methods and results from the summer 2009 small mammal sampling program. This document is organized into the following sections:

- Section 2—Site Background Information. This section provides a general characterization of physical location of the OU3 and reference sites, and lists the trap locations.
- Section 3—Small Mammal Methods. This section describes the methods used to trap and necropsy small mammals, methods used to estimate the captured animal's age, and the methods used to analyze the histology data.
- Section 4—Small Mammal Results. This section presents information on the animals captured, their estimated age, description of necropsy results, a summary of the pathologist's report regarding tissue histology findings, and the statistical analyses conducted with the histology data.

² Five target tissues were harvested from all animals: larynx, thyroid; complete gastrointestinal (GI) tract (esophagus, stomach, small intestine, and large intestine), complete pulmonary tract (trachea, bronchi, lungs); and adrenal glands. Lesions in non-target tissues were harvested for histology if gross lesions were observed.

- Section 5—Conclusions. This section summarizes the pertinent conclusions from this study.
- Section 6—References. This section contains references for documents cited in this data report.

Twelve appendices detail the study results through additional reports, photocopies of raw data, photo documentation, and detailed data tables. They are referenced throughout this report and include:

- Appendix A—Reconnaissance Memorandum
- Appendix B—Field Sample Data Sheets
- Appendix C—Small Mammal Trapping Logbook
- Appendix D—Field Logbook
- Appendix E—Necropsy Logbooks
- Appendix F—Field Photographs
- Appendix G—Field Data for Small Mammals
- Appendix H—Laboratory Photographs
- Appendix I—Northwest Zoopath Histology Report
 - Attachment I—Northwest Zoopath Response to USEPA comments
- Appendix J1—Peromyscus Eye Lens Weight Determination- Standard Operating Procedure
- Appendix J2—Peromyscus Eye Lens Weight Raw Data Sheets
- Appendix J3—Mouse Lens Weight Data
- Appendix J4—Mammal Age
- Appendix K—Statistics Results
- Appendix L—Response to USEPA comments on Draft Small Mammal Report

2.0 SITE BACKGROUND INFORMATION

Libby is a small city in northwestern Montana that is located approximately 10 miles southwest of a large vermiculite mine (Figure 2-1). Vermiculite from the mine at Libby is known to be contaminated with amphibole asbestos. Historic mining, milling, and processing of vermiculite at the site are known to have caused releases of asbestos to the environment. Inhalation of asbestos associated with the vermiculite caused a range of adverse health effects in exposed humans, including workers at the mine and processing facilities. Based on these adverse effects, USEPA listed the Libby Asbestos Site on the National Priorities List in October 2002.

At the Libby Asbestos Site, a mixture of minerals including richterite, winchite, actinolite, and tremolite (referred to as LA) were sampled and analyzed. Using CERCLA authority, USEPA started implementing a range of cleanup actions at the site in 2000 to eliminate sources of LA exposure to area residents and workers. Given the size and complexity of the Libby Asbestos Site, USEPA designated a number of Operable Units (OUs) for planning and developing the RI/FS. The preliminary boundaries of OU3 and the location of the Libby Mine site area are shown in Figure 2-1. The focus of the Phase III activities addressed in this report was on small mammal ecological data needs for OU3 in support of the baseline ecological risk assessment (USEPA 2009a,b).

2.1 OU3 and Reference Site Reconnaissance

A reconnaissance trip to Libby OU3 and upwind reference areas was conducted between June 22 and June 24, 2009. The goals of the reconnaissance trip were to identify whether modifications to small mammal trapping methods and procedures specified in the USEPA Phase III SAP (USEPA 2009a,b) would be required, identify and mark (with stakes and using Global Positioning System coordinates) the perimeter of the OU3 and upwind reference areas where sampling would occur, and determine terrain and trap area(s) accessibility.

The reconnaissance trip findings indicated that there were areas within the center of the forested polygon on OU3 that, given terrain limitations (severe slopes in particular), could not be trapped due to problems with equipment deployment and practical access for the sampling personnel. The reconnaissance trip also found that the between-trap distance desired (100 meters) was not practical given terrain limitations and the overall size of the polygon; a minimum trap distance of 15 feet was targeted instead. The USEPA-approved reconnaissance memorandum is provided in Appendix A.

2.2 OU3 and Reference Site Mammal trap locations

Table 2-1 summarizes the OU3 and reference site small mammal trap line locations. Figure 2-2 shows an aerial photograph of the polygon area, including the corners represented by the highest duff concentrations of LA. The locations of trap line placement within OU3 and the reference areas are shown (respectively) in Figures 2-2 and 2-3.

TABLE 2-1

OU3 and Reference Locations Evaluated in 2009 for Small Mammals

Trap Line Location Code	Location Descriptor	Location	UTM N	UTM W
SM-R-A	Transect A	Reference Area	5369886	609214
SM-R-B	Transect B	Reference Area	5368638	607891
SM-R-C	Transect C	Reference Area	5368078	608732
SM-R-D	Transect D	Reference Area	5369981	609145
SM-S-A	Transect A	OU3	5367288	618990
SM-S-B	Transect B	OU3	5367601	618592
SM-S-C	Transect C	OU3	5367882	618542
SM-S-D	Transect D	OU3	5367611	617632
SM-S-E	Transect E	OU3	5366776	619492
SM-S-F	Transect F	OU3	5367198	618391

UTM NAD83, Zone 11

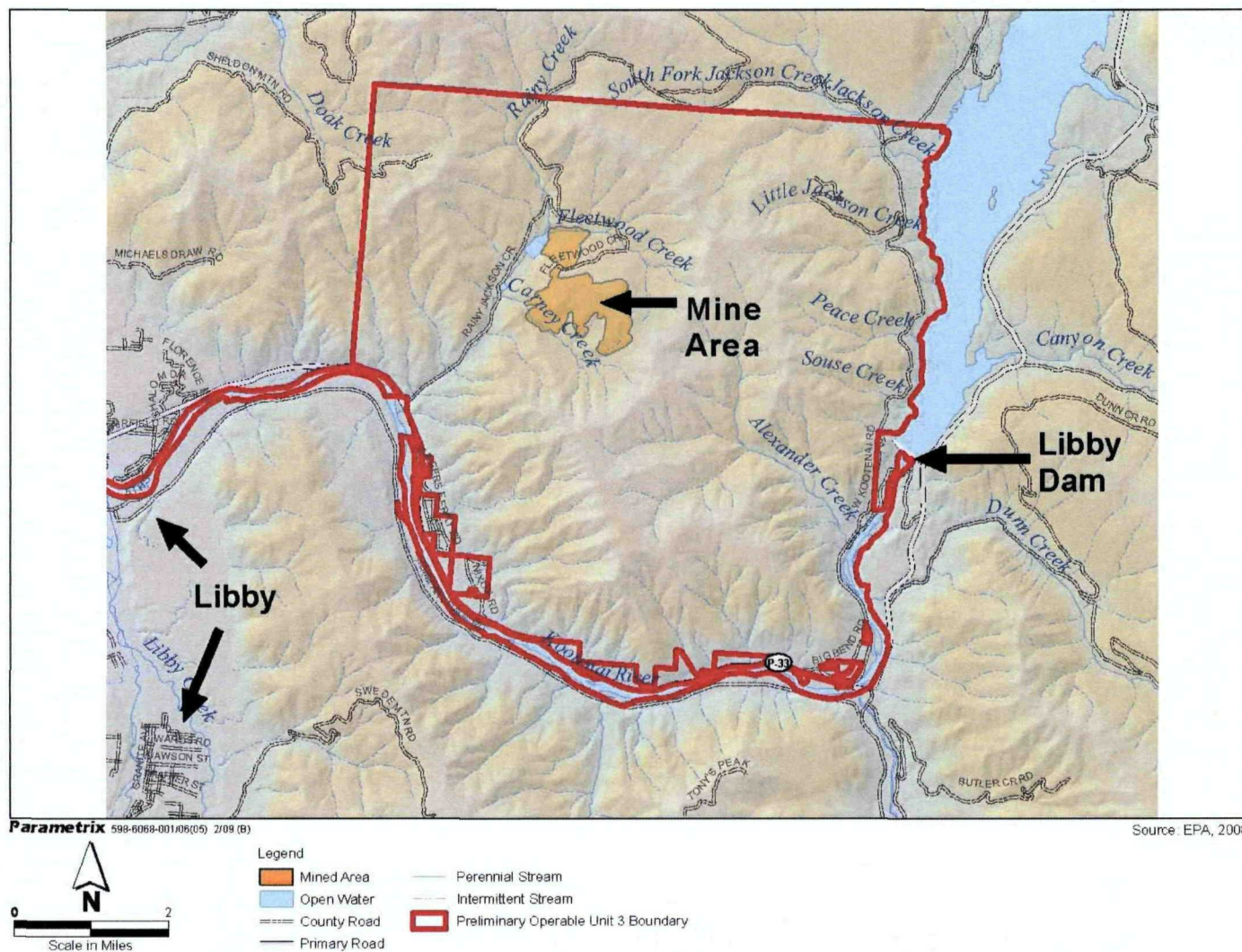


Figure 2-1 Libby Montana Superfund Site Operable Unit 3

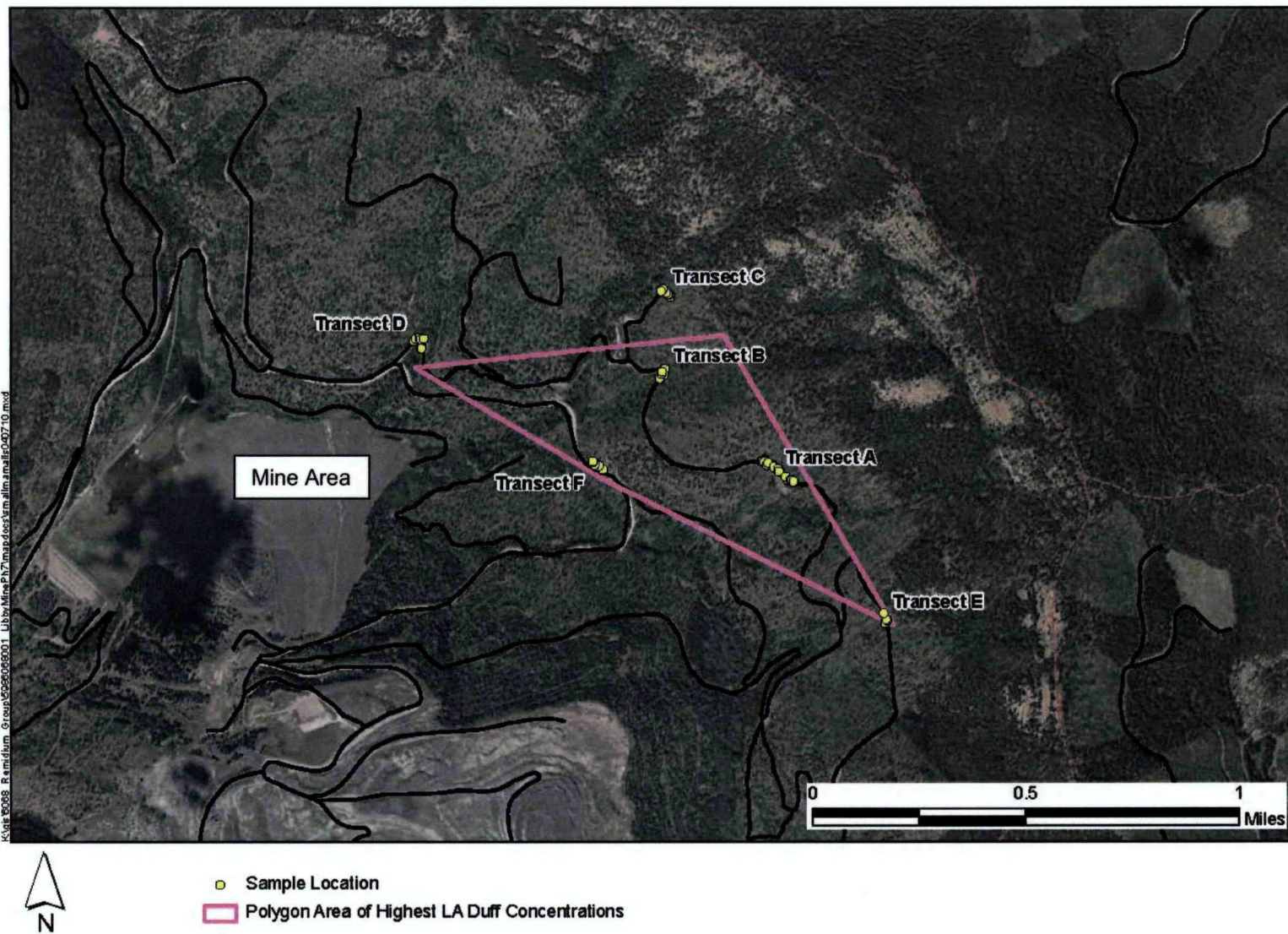


Figure 2-2 Libby Montana Superfund Site Operable Unit 3, Small Mammal Transect and Sample Locations



Figure 2-3 Libby Montana Superfund Site, Small Mammal Reference Area, Transect and Sample Locations

3.0 SMALL MAMMAL METHODS

Trapping and necropsies were done between August 27th and September 2nd, 2009. Preparation of tissues and histological examinations occurred during the subsequent months, and were complete by December 2009-January 2010. All field and laboratory data collection activities supporting the small mammal collections followed the methods outlined in the Phase III SAP and associated Standard Operating Procedures (SOPs) (USEPA 2009a,b). Data collected on small mammals in the field were entered onto small mammal Field Sample Data Sheets (FSDSs), and logbooks. The small mammal FSDSs, and small mammal trapping, field, and necropsy logbooks are presented in Appendices B, C, D and E, respectively. Photo documentation is in Appendix F (field) and H (necropsy), and field data are summarized in Appendix G. The histological examination report is in Appendix I.

3.1 Target Species

The small mammal species targeted for tissue collection have small home ranges, forage on the ground, and have small body weights that will ensure representation of highly-exposed individuals, and thus maximize the potential to observe histological lesions associated with asbestos exposure. The two species targeted for tissue collection were the deer mouse (*Peromyscus maniculatus*) and the southern red-backed vole (*Clethrionomys gapperi*). A total of 30 animals per species per location (OU3, reference sites) was desired, for a total of 120 animals. Equal numbers of males and females were desired to the extent possible. Both species were identified as being the most common ground-foraging small mammals in Lincoln County (USEPA 2009a).

Field collection of target animals, euthanasia, necropsy, tissue harvesting, and histological examinations were all conducted under approved scientific collection permit requirements, approved Institutional Animal Care and Use Committee (IACUC) (MDFWP 2009) and American Veterinary Medical Association (AVMA) procedures, and in accordance with Phase III SAP procedures and SOPs (USEPA 2009a,b).

3.2 Trapping

While many types of traps are available, Sherman live traps and Havahart® live traps were considered the most appropriate for collection of deer mice and red-backed voles. Sherman live traps are a type of box trap that are the most effective for capturing small terrestrial mammals unharmed (Wilson et al. 1996). Havahart® traps were also included because their design, also effective with small mammals, allows ready visibility of trapped animals. Traps were placed along trap lines at spacing intervals appropriate to field conditions, as outlined in the Phase III SAP (USEPA 2009a,b) and the Reconnaissance Memorandum (Appendix A).

Each individual trap along a transect line was assigned a number sequentially, beginning at the end closest to the road. Each trap was placed no closer than 15 feet from the next trap. In some cases parallel transect lines were used to expand the area that was covered, in which case transects were lettered sequentially beginning with the line closest to the road. The location and orientation of each

transect line was sketched in the field logbook (see Appendix D). The transects and number of traps set on each trap night are presented in Table 3-1. There generally was an even mix of Sherman and Havahart® traps used at each transect.

Traps were set 1 to 3 hours before dusk and checked 1 to 2 hours after sunrise. Traps were baited with a 60:40 peanut butter and rolled oats mixture at the time of set. When a sprung trap was found, it was checked for captured animals. If the trap contained a non-target species, this information was recorded in the small mammal trapping logbook (see Appendix C) and the animal was released in the vicinity of the capture location. If the trap was sprung, but no animal was present, this information was noted in the field logbook (see Appendix D). When a sprung trap contained a target species, this information was recorded in the small mammal trapping and field logbooks, and the live animal(s) was transported in the trap to the field processing laboratory as quickly as possible. All un-sprung traps were placed back on the ground in the "unarmed" position until being reset and re-baited later in the day. Representative photographs of small mammal field collection activities at trap locations and transects are in Appendix F.

Field data for all small mammals caught from the OU3 and the reference areas are summarized in Appendix G and includes date caught, trap number, transect location, transect identification number, and global position system data. Recorded species codes are summarized in Table 3-2.

TABLE 3-1
Location and Number of Traps Set Per Trap Night

Location Sampled	Date	Number of Traps Set
Reference Area		
Transect A	8/27/2009	43
Transect A	8/28/2009	59
Transect A	8/29/2009	65
Transect A	8/30/2009	65
Transect B	8/27/2009	32
Transect C	8/28/2009	26
Transect C	8/29/2009	32
Transect D	8/28/2009	32
Transect D	8/29/2009	38
OU3		
Transect A	8/30/2009	35
Transect A	8/31/2009	35
Transect A	9/1/2009	35
Transect B	8/30/2009	37
Transect C	8/31/2009	19
Transect D	8/31/2009	20
Transect E	9/1/2009	20
Transect E	9/2/2009	31
Transect F	9/1/2009	19
Transect F	9/2/2009	32

TABLE 3-2
Small Mammal Species Abbreviation Codes

Species Code	Common Name	Scientific Name
BTWR	Bushy-tailed woodrat	<i>Neotoma cinerea</i>
DEMO	Deer mouse	<i>Peromyscus maniculatus</i>
SRBV	Southern red-backed vole	<i>Clethrionomys gapperi</i>
YPCM	Yellow pine chipmunk	<i>Tamias amoenus</i>
WJMO	Western jumping mice	<i>Zapus princeps</i>

3.3 Necropsy and Tissue Processing

All animal processing activities, including holding, euthanasia, necropsy, tissue harvesting, and histological examinations, were conducted under approved scientific collection permit requirements, approved IACUC (MDFWP 2009) and AVMA procedures, and in accordance with Phase III SAP SOPs (USEPA 2009a,b).

Live animals trapped during field collection activities were rapidly transported in their traps to the offsite small mammal field laboratory for processing. Live animals were held in their traps at the processing laboratory until euthanized for necropsy and tissue processing; food (rolled oats) and water was provided if animals were held longer than an hour. No live animals were held more than six hours prior to processing on any given day.

Trap and animal identification information was recorded on a small mammal FSDS for each animal prior to euthanasia. A trap containing a single live animal was placed into the euthanasia chamber (Euthanex Corporation, Palmer, PA, Model CM1) and carbon dioxide gas administered until death was confirmed (no obvious breathing; generally this took 4 to 5 minutes per animal). The animal was removed from the chamber and placed on waxed paper marked with the animal identification number. The animal was weighed to the nearest 0.1 gram and the weight recorded on the small mammal FSDS. The animal was sprayed lightly with a bleach solution, followed by a mild soap solution. Plastic, formalin pre-filled (10 percent neutral buffered) sample collection jars were labeled with animal identification numbers for preserving collected tissues. Pre-weighed and marked (with vial number) 7 ml glass tissue collection vials were used for collection of non-preserved tissue (to be used, if needed, for LA analysis).

Necropsy examinations for each animal were recorded in bound necropsy logbooks (Appendix E) and the information also was summarized on a small mammal FSDS form (Appendix B). Each animal was examined externally for abnormalities and sex, measured (length from snout to tip of tail), and photographed to document dorsal and ventral views. Eyeballs were removed and preserved in one of the formalin jars for later use in animal aging. Animals were opened and the body cavity and viscera photographed (frame numbers recorded in logbooks) to provide a view of internal organ placement and appearance. Internal organs were examined for abnormalities and lesions and additional photographs taken (and frames recorded) as necessary. Where necessary, the sex of an animal was confirmed through internal examination and pregnancy (if visually apparent) was noted. Additional photographs of internal lesions (if any) were taken and frame numbers recorded in the logbooks. Tissue samples for possible future LA analysis were harvested prior to contact with the formalin preservative. With the exception of the pulmonary tract (free floating in formalin-filled jar) all targeted tissues for histology were removed and preserved within individually-labeled tissue cassettes. Targeted tissues included the larynx, thyroid, complete gastrointestinal (GI) tract (esophagus, stomach, small intestine, and large intestine), complete pulmonary tract (trachea, bronchi, lungs), and adrenal glands. Where bot fly (*Cuterebra* sp.) larvae were present in identified lesions, the larvae was removed, weighed and the larvae weight recorded in the logbook. Larvae were submitted in a separate formalin jar for archival with the mouse carcass.

Target tissues, bot fly larvae and the remaining animal carcass were all submitted to Northwest ZooPath, Monroe, Washington. Bot fly larvae were sent for archival purposes only. Remaining animal carcasses were also sent for archival purposes and also for consult (if necessary) by the histologist. Target tissues

for histology were sectioned, mounted and stained by Northwest ZooPath according to the Histology SOP (HISTO-LIBBY- OU3 (Rev 1) (USEPA 2009a,b). Preserved eyeballs were submitted to the Parametrix Environmental Research Laboratory (PERL) for processing to support determination of animal age.

Appendix H presents photographs illustrating the laboratory set up, including euthanasia chamber, and the necropsy work stations.

3.4 Histology

Histological reviews of target tissues and of identified lesions in non-target tissues were conducted by Dr. Michael Garner, DVM, Diplomate (Board Certified) of the American College of Veterinary Pathologists, Northwest ZooPath, Monroe, Washington. Tissues were processed for histological examination in accordance with the Phase III SAP (USEPA 2009a,b) and the Histology SOP (HISTO-LIBBY-OU3, Rev 1), with the exception of two minor deviations (Section 3.6).

Preserved animal carcasses, bat fly larvae, target tissue slides, and non-target tissue slides are all currently archived at Northwest ZooPath in the event of future need. Dr. Garner's full and complete histology report with additional methodological detail is contained in Appendix I, including an addendum prepared by Dr. Garner in reply to USEPA comments on the draft data report.

3.5 Age Estimation

According to the Phase III SAP (USEPA 2009a,b), the age of small mammals collected at OU3 and the reference area was determined following a modification of the procedure established by Lord (1959). This procedure involves identifying the age of an animal using dry lens weight based on an established relationship of dry lens weight and age data for animals of known ages. The literature was examined to identify lens weight – age relationship data for the target species in this study. A study by Millar and Iverson (1976) using two deer mouse species (*P. maniculatus* and *P. leucopus*) was identified and the regression of eye lens weight on age from this study was used for age determination.

Following procedures outlined in the SOP, Dry Weight Determination of the Lens of an Eye, PERL SOP No. 5330 (Appendix J1), the weights of the individual eye lenses were recorded on laboratory sheets (Appendix J2). To obtain the dry weight, the individual eyes were placed in a pre-weighed weighing boat and a wet weight recorded. The weigh boat was placed in a drying oven set at 95° C until the eye lenses were dry. Eye lenses were considered "dry" when they reached a constant weight. All lenses achieved stable weights by 96 hours and were weighed to the nearest 0.01 mg. The dried eye lens weights are provided in Appendix J3.

Using the regression relationship between the known age and eye lens weights of *P. maniculatus* developed by Millar and Iverson (1976), the ages of the *P. maniculatus* caught at OU3 and the reference

area were estimated using the average of the two dried eye lens weights (Appendix J4). Excel® 2003 was used for conducting the regressions (Microsoft 2003).

3.6 Data Analysis

Analysis of small mammal data was in accordance the Phase III SAP procedures and SOPs (USEPA 2009a,b). Tabular summaries of OU3 and reference data were used to facilitate comparisons of locations for key small mammal capture patterns. Tabular summaries were also used to compare various biological data (lengths, weights, sex ratios, lens weights, etc) for small mammals between OU3 locations and the reference sites.

Histology scores for individual animal tissues and the whole animal score (as assigned by Northwest ZooPath), were each compared between OU3 and the reference area to examine differences using a non-parametric Wilcoxon Rank Sum (WRS) test (USEPA 2002). Tissue "group" scores (i.e., lower, upper or complete respiratory tract; lower, upper or complete GI tract), comprised of the individual tissue scores within a tissue group, were also compared using the WRS test. The non-parametric statistical tests were conducted using SPSS software for Windows, Version 13.0 (SPSS 2004). Note: In SPSS, a Mann-Whitney U test is used to provide results that are equivalent to the WRS test and the Kruskal-Wallis test for two groups (SPSS 2004). Accordingly the output from SPSS provides both the Wilcoxon rank sum W statistic and the Mann-Whitney U statistic. The significance of any difference between groups is the same with either statistic. Both 2-tailed and 1-tailed p-values were calculated.

Fisher's Exact Test was also run in SPSS to compare the frequency of lesions in individual tissues and tissue groupings between the two areas (as compared to the Wilcoxon Rank Sum that tests the overall scores between the tissues). Again, both 2-tailed and 1-tailed p-values were calculated.

Lesion scores for non-target tissues submitted for histological examination (including bot lesions, liver lesions, and a single spleen lesion) were not statistically compared between OU3 and reference sites because either (1) the lesions did not occur in reference animals (i.e., liver lesions of un-established etiology, single spleen lesion) to permit a comparison, or (2) the lesions (bot fly, liver, spleen) were submitted for histology confirmation in only a subset of the animals in which they occurred.

3.7 Protocol Deviations

Overall, there were few deviations from the Phase III SAP and SOPs and none of the identified deviations had a significant effect on the quality of the data collected or the interpretation thereof.

The following SOP deviations were identified:

1. Dorsal and ventral view photographs for one reference animal (# SM-R-C-14-1) were inadvertently deleted, though they were recorded as frames 51 and 52 in the necropsy technician's logbook (frames 51 and 52 represent another animal).

2. A numeric scoring procedure for lesion "distribution" within a tissue (lesion distribution scores were not articulated in the histology SOP) was added to the determination of a tissue specific (and ultimately a total animal) score. The lesion distribution scoring is defined in Dr. Garner's histology report (Appendix I).
3. A slightly modified definition of what constitutes a "pathos factor" of 2 (attributable to asbestos) in determining lesion severity was used as compared to the definition originally contained in the histology SOP. The updated definition is more technically accurate according to Dr. Garner and the revised definition is provided in Dr. Garner's histology report (Appendix I). The modified definition refers to lesions that overlap those from asbestos causes, rather than lesions caused by asbestos.

4.0 SMALL MAMMAL RESULTS

4.1 Trap Success

The Phase III SAP (USEPA 2009a,b) identified two target species for collection: the southern red-backed vole (*C. gapperi*) and the deer mouse (*P. maniculatus*). The southern red-backed vole was not captured at either the OU3 or reference sites, which may be due in part to the animal's preference for habitat that is wetter than the generally dry conditions dominant at both OU3 and the reference sites (Allen 1983). Deer mice were collected from 37 trap locations (representing 6 transects) at OU3 (Figure 2-2) and from 30 trap locations (representing 4 transects) at the reference area (Figure 2-3).

Thirty mice (and 30 voles) were targeted for collection each at reference and OU3 location in the Phase III SAP (USEPA 2009a,b), for a study target of 120 animals of the two species (an equal number of males and females was desired if possible). Overall, a total of 72 deer mice were captured (12 more than the minimum required in the Phase III SAP); 34 of these animals were from the reference sites and 38 from the OU3 sites. The number of mammals caught by species, location, and transect are presented in Table 4-1. Several non-target species were caught, including yellow-pine chipmunks (*Tamias amoenus*), bushy-tailed woodrats (*Neotoma cinerea*) and a western jumping mouse (*Zapus princeps*). Overall, deer mice (*P. maniculatus*) were caught more often than non-target species from all but one transect (Table 4-1). More yellow-pine chipmunks were caught than deer mice from Transect B in the reference area.

TABLE 4-1
Capture Counts by Location and Transect

Transect Sampled	Species Collected	Count
Reference Area		
Transect A	Deer mouse	23
Transect A	Yellow-pine chipmunk	5
Transect B	Yellow-pine chipmunk	2
Transect B	Deer mouse	1
Transect B	Bushy-tailed woodrat	1
Transect C	Deer mouse	5
Transect C	Yellow-pine chipmunk	1
Transect C	Bushy-tailed woodrat	1
Transect D	Deer mouse	5
Transect D	Yellow-pine chipmunk	2
OU3		
Transect A	Deer mouse	15
Transect A	Yellow-pine chipmunk	7
Transect A	Western jumping mouse	1
Transect B	Deer mouse	5
Transect C	Deer mouse	5 ^a
Transect C	Bushy-tailed woodrat	1
Transect D	Deer mouse	7
Transect E	Deer mouse	2
Transect E	Yellow-pine chipmunk	2
Transect F	Deer mouse	5
Transect F	Yellow-pine chipmunk	1

^a One animal escaped. Only four of these animals were submitted for necropsy.

4.2 Length, Body Weight and Sex Ratios

Lengths, weights, and sex of all captured deer mice were recorded at the field laboratory per the Phase III SAP/SOPs and are presented in Appendix G. Deer mouse weight ranges are summarized in Table 4-2 and include corrections for those mice where bot fly larvae weights were recorded (Appendix G). A wide range of body weights was observed for the deer mice for both the OU3 and reference transects. The range of weights (including both sexes) was 10.4 to 20.8 grams and 10.5 to 23.7 grams for the reference area and OU3 transects, respectively.

TABLE 4-2
Deer Mice Body Weights

Location Sampled	Sex	Average Weight (g)	Max. Weight (g)	Min. Weight (g)
Reference Area				
Transect A	Female	15.7	20.8	11.2
Transect A	Male	15.7	20.6	10.4
Transect B	Female	16.5	16.5	16.5
Transect C	Female	14.9	17.4	12.4
Transect C	Male	15.4	15.4	15.4
Transect D	Female	13.3	15.8	10.7
Transect D	Male	14.3	14.3	14.3
OU3				
Transect A	Female	15.9	23.7	13.1
Transect A	Male	16.2	19.8	14.0
Transect B	Female	15.0	16.9	13.0
Transect B	Male	12.2	13.9	10.5
Transect C	Female	13.5	16.1	12.1
Transect C	Male	17.6	17.6	17.6
Transect D	Female	12.8	16.5	11.1
Transect D	Male	15.6	16.5	14.7
Transect E	Male	17.5	19.3	15.6
Transect F	Female	12.6	12.6	12.6
Transect F	Male	16.3	20.7	14.6

g= grams.

Table 4-3 summarizes the body length (nose to tip of tail) data for deer mice captured at the OU3 and reference sites. The body lengths for both sexes ranged from 14.6 to 17.8 centimeters and 13.3 to 18.7 centimeters for the reference area and OU3, respectively.

TABLE 4-3
Length Data for Deer Mice

Location Sampled	Sex	Average Length (cm)	Max. Length (cm)	Min. Length (cm)
Reference Area				
Transect A	Female	16.2	17.8	14.6
Transect A	Male	16.4	17.8	14.6
Transect B	Female	16.5	16.5	16.5
Transect C	Female	16.6	17.5	15.2
Transect C	Male	16.5	16.5	16.5
Transect D	Female	16.1	17.1	14.6
Transect D	Male	16.5	16.5	16.5
OU3				
Transect A	Female	16.4	18.7	15.2
Transect A	Male	16.2	17.1	15.6
Transect B	Female	15.6	15.9	15.2
Transect B	Male	14.7	14.9	14.6
Transect C	Female	14.8	15.2	14.6
Transect C	Male	15.9	15.9	15.9
Transect D	Female	14.5	15.9	13.3
Transect D	Male	16.2	16.5	15.9
Transect E	Male	17.5	17.5	17.5
Transect F	Female	15.6	15.6	15.6
Transect F	Male	16.4	18.4	14.9

cm = centimeters.

Table 4-4 summarizes the number of females and males captured, as well as the sex ratio of females to males. Although the sex ratios between transects varied, there were generally more females caught from each transect than males in the reference area. The overall female-to-male sex ratio for the reference area was 1.8. Conversely for OU3, there were generally more males captured at each transect and the overall female-to-male sex ratio for OU3 was 0.8.

TABLE 4-4
Deer Mice Sex Ratios by Transect

Location Sampled	Number of Females	Number of Males	Ratio of Females to Males
Reference Area			
Transect A	13	10	1.3
Transect B	1	0	No males
Transect C	4	1	4.0
Transect D	4	1	4.0
OU3			
Transect A	6	9	0.7
Transect B	2	3	0.7
Transect C	3	1	3.0
Transect D	5	2	2.5
Transect E	0	2	No females
Transect F	1	4	0.3

4.3 Deer Mice Age

Age of the captured deer mice was estimated based on the eye lens weights of the mice, in accordance with the Phase III SAP (USEPA 2009a,b), based on an aging procedure initially developed for use with rabbits by Lord (1959) and the regression equation from Millar and Iverson (1976). The individual average dry lens weight/age relationship is illustrated in Figure 4-1. Averaged individual mouse eye lens weights are provided in Appendix J4.

Estimated ages for mice at both the OU3 and reference sites (Table 4-5) were variable and ranged from 96 to 316 days (three to over ten months of age). The average age of deer mice at OU3 ranged from 96 to 226 days (three to seven months) and at the reference site from 113 to 316 days (three-and-a-half to ten months). Figure 4-2 illustrates the relationship between measured body weight and predicted age. As shown in Figure 4-2, there was considerable variation in estimated ages at a given body weight. For example, for a mouse weighing between 14.7 to 15.3 grams (6.6 to 9.4 milligrams eye lens dry weight), the estimated age ranged from 71 to 180 days (Figure 4-2). This amount of variance was expected as the range in the estimates at a given age was wide in the Millar and Iverson (1976) dataset.

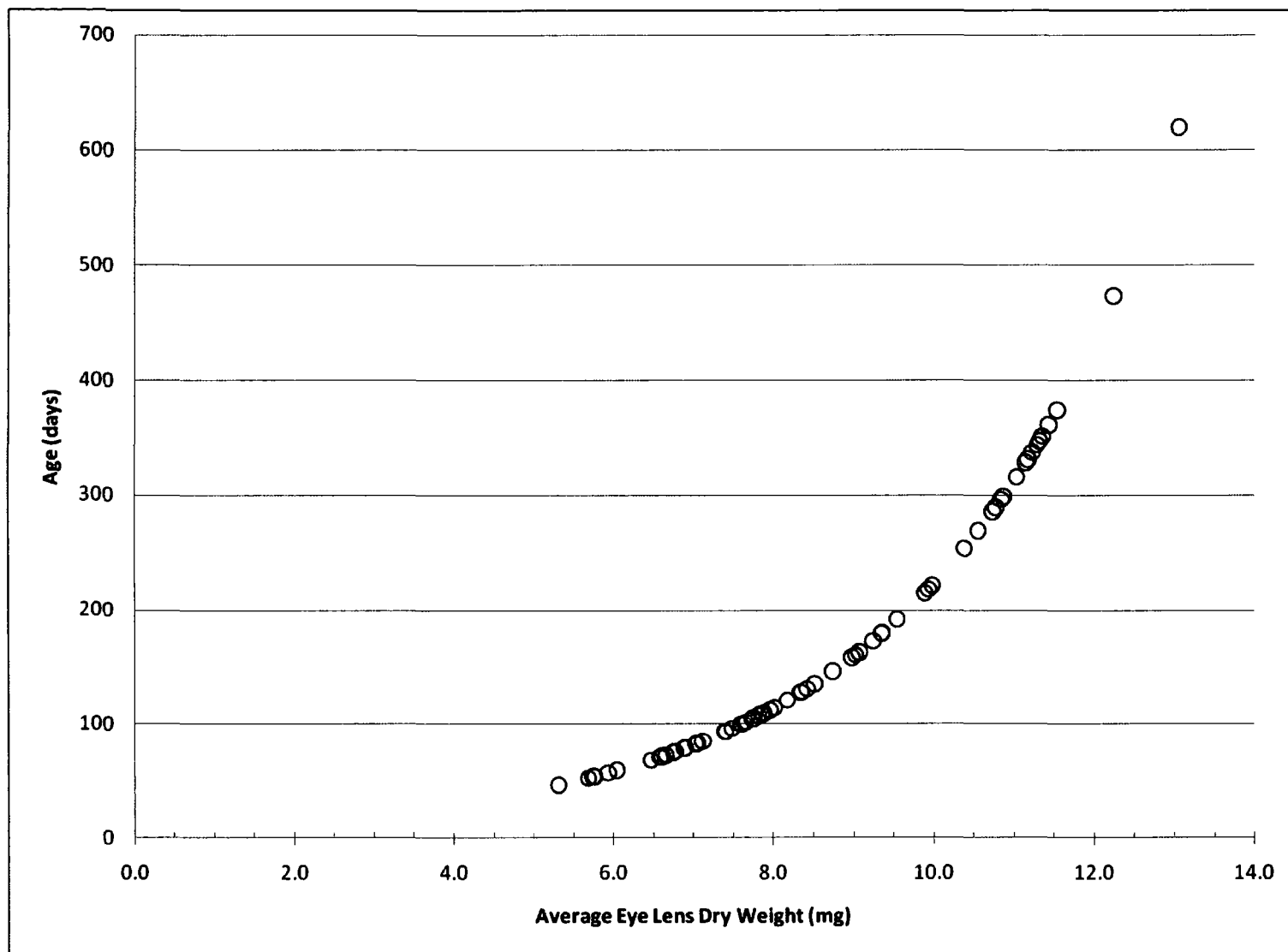


Figure 4-1 Relationship Between Average Eye Lens Weight and Age for Study Deer Mice (Based on Millar & Iverson [1976])

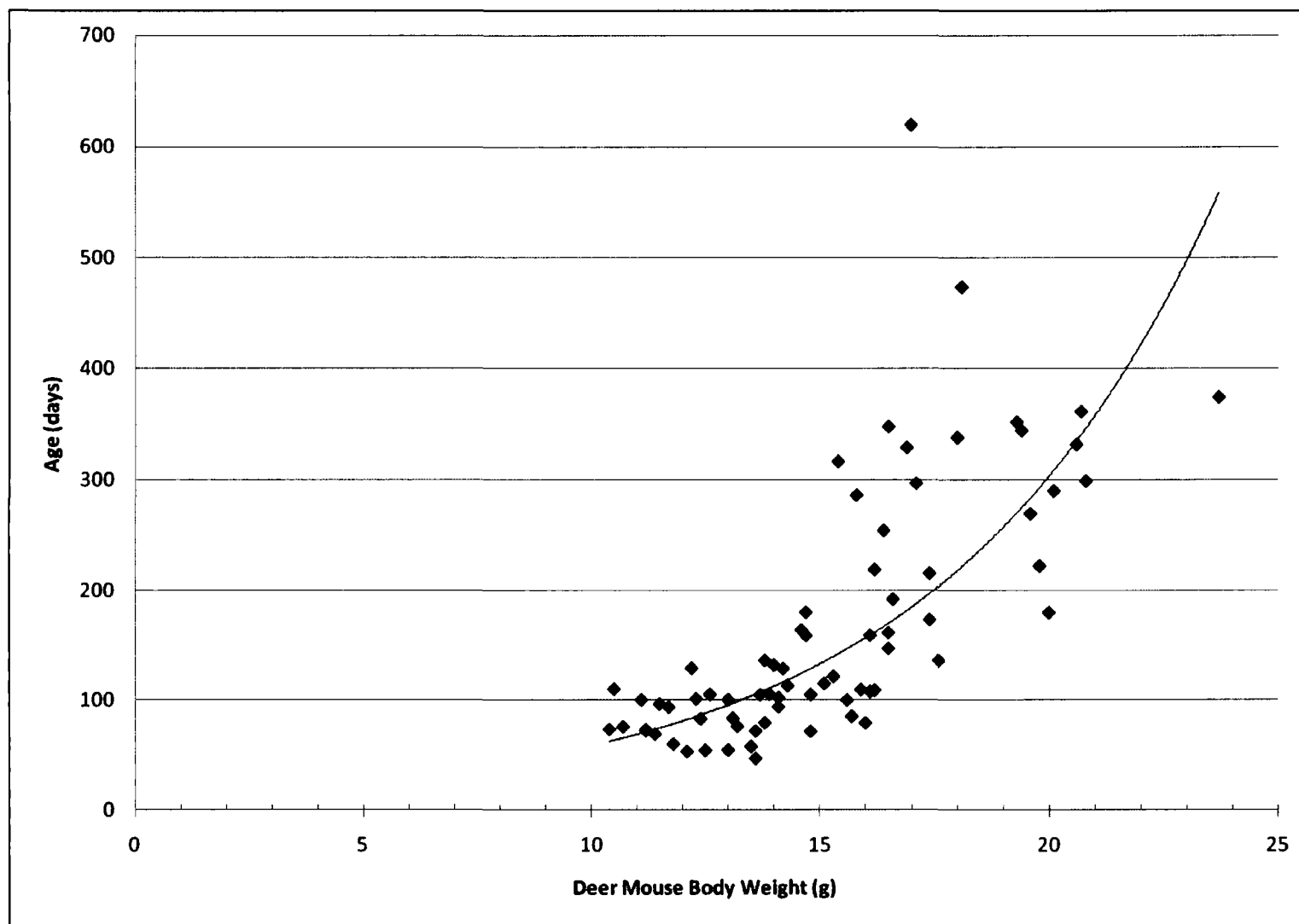


Figure 4-2 Relationship Between Body Weight and Age of Study Animals (Deer Mice)

TABLE 4-5
Predicted Age of Study Deer Mice

Location Sampled	Sex	Average Weight (g)	Average Age (days)
Reference Area			
Transect A	Female	15.7	180
Transect A	Male	15.7	218
Transect B	Female	16.5	161
Transect C	Female	14.9	155
Transect C	Male	15.4	316
Transect D	Female	13.3	139
Transect D	Male	14.3	113
OU3			
Transect A	Female	15.9	165
Transect A	Male	16.2	137
Transect B	Female	15.0	214
Transect B	Male	12.2	105
Transect C	Female	13.5	96
Transect C	Male	17.6	136
Transect D	Female	12.8	142
Transect D	Male	15.6	163
Transect E	Male	17.5	226
Transect F	Female	12.6	105
Transect F	Male	16.3	186

g= grams.

4.4 Necropsy

Figure 4-3 illustrates the laboratory set up for the necropsies and tissue harvesting. The result of each animal necropsy was documented in necropsy logbooks and on small mammal FSDS forms (Appendices E and B, respectively). Frame numbers for each photograph taken are also recorded for each animal in the necropsy logbooks. Appendix E contains all documentation of animal necropsies by photograph frame number. With the exception of some photographs of specific lesions (see notebooks for photo frame numbers of these, which were commonly out of sequence), animal identification numbers are visible in the photographs.

Estimated ages (Section 4.3) and necropsy observations by the technicians support that the captured animals were largely adults. None of the female mice were pregnant at the time of necropsy though at least one animal was thought to be lactating. Sexual maturity in female mice varies with photoperiod, food availability, and other factors, but for *Peromyscus* has been reported to average 51 days (Clark 1938).



Parametrix 598-6068-001/07(06) 4/10 (B)

Figure 4-3 Field Necropsy Laboratory

No deformities were observed in any of the animals and all animals appeared to be in good health. Clear evidence of consumption of trap bait was observed in many animals (stomachs full of oats). A number of animals exhibited evidence of either active or previous infection by bot flies (*Cuterebra* sp.), largely in the perirectal area, though these infections did not appear to have any apparent impact on the health of the animals.

Target tissues for histology and possible future LA analysis were harvested from all animals without incident, with the exception of the trachea and thyroid of a single reference animal, which were lost during necropsy. Lung perfusions were difficult to perform on a number of animals, largely due to the small size of the trachea. Several of the bot fly lesions were harvested for confirmation by the histologist³ though not all obvious bot lesions were harvested. Liver lesions, ranging in gross appearance from mild to severe, were sampled for histology from nine animals collected from OU3. One OU3 animal had a possible spleen lesion that was also submitted for histology.

4.5 Histology

Consistent with the Phase III SAP, the histologist scored individual target tissues and also estimated an overall (total) animal histology score. Overall, the histology findings did not support a conclusion of asbestos pathology in any of the mice, with all lesions identified by the histologist being attributable to parasite infection/infectious disease. The full and complete report by pathologist Dr. Michael Garner (Northwest ZooPath) is provided in Appendix I, including an Addendum addressing questions and comments submitted by the USEPA (Attachment I).

The following histology results, presented by tissue type (target, other) were taken from the histologist's report / addendum:

- Light microscopy was used to examine the tissues, which can resolve structures to approximately 1 micron in diameter. No asbestos fibers were observed in any tissues examined.
- Pulmonary Tract—Histological changes in the respiratory tract were seen in all of the study mice, however, the patterns and cellular constituents were not supportive of asbestos exposure. The lesions in these tissues were largely attributed to infectious disease. At least three separate parasitic agents were identified in the respiratory tract of the study mice, and it is likely that the bulk of the inflammatory changes in these mice are due to parasitism. Bacteria and intranuclear inclusions resembling cytomegalovirus, adenovirus, or possibly polyomavirus inclusions may have also contributed to the inflammatory changes observed.
- GI Tract—Lesions were primarily inflammatory, mild, and confined to the small intestine. With the exception of a few foreign body granulomas, all inflammatory changes were attributed to expected forms of parasitism, including coccidiosis, cryptosporidiosis, nematodiasis, and cestodiasis. A few mice had intranuclear inclusions in mucosal

³ The Small Mammal Collection and Processing SOP did not require that "obvious" parasite lesions be collected, but several bot fly lesions were provided to the histologist for confirmation regardless (typically noted as perirectal abscesses).

epithelial cells resembling cytomegalovirus inclusions, and this agent may have also contributed to some of the inflammation. Bacteria, yeasts, and flagellated protozoa were also seen primarily in the large intestine and likely were incidental findings. A single squamous papilloma was noted in the anus of one mouse and may have been induced by trauma, papillomavirus, or herpesvirus infection. The adenomatous polyps described in rodents experimentally exposed orally to asbestos were not seen in this study.

- **Thyroid**—Lesions included mild cystic ectasia in one mouse, mild colloid depletion in one mouse, and mild diffuse follicular epithelial cell hypertrophy in one mouse. These findings were considered incidental and may have been age related, or due to illness associated with other disease. The C cell hyperplasia and adenomas associated with experimental exposure to asbestos in rats were not seen in the study mice.
- **Adrenals**—Adrenal lesions in the study mice were uncommon and included inflammation, hemosiderosis, and vacuolar change in cortical epithelium. The inflammation and hemosiderosis were likely due to parasite migration. Vacuolar change is common in the adrenal cortex of mammals and can be due to lipidosis or stress. No neoplastic processes were seen in the adrenals of study animals, including the adenomas reported in hamsters orally exposed to asbestos.
- **Other lesions**
 - Lesions associated with the parasitic bot fly, *Cuterebra* sp., were identified during necropsy in 16 animals, including 4 reference animals and 12 OU3 animals. A subset of bot fly lesions submitted for histology were confirmed as perirectal abscesses of the type associated with bot fly infections.
 - Liver lesions were submitted from nine animals—seven from OU3, and two from the reference site. Two primary lesions were noted in the few livers that were examined histologically. First, capillariasis due to *Capillaria hepatica* (a nematode worm) was fulminate in eight of the nine livers examined. In spite of the severity and chronicity of the lesions, it is possible that the condition was well tolerated in the affected mice, since they appeared to be in good nutritional state. Second, the portal tract in all examined livers had mild infiltrates of lymphocytes and plasma cells. This is a common lesion associated with ascending inflammatory processes of the biliary tree and likely also was due to parasitism. No toxic or neoplastic lesions were seen in any of the examined livers.
 - Spleen—No lesion was observed in the single spleen submitted from an OU3 mouse.
- **Other tissues**—several tissues were examined opportunistically during the study. Lesions in these tissues mirrored those seen in the target tissues and provided no further information that would indicate exposure to asbestos in the study mice.
- **Observed lesions in the respiratory tract** similar to those that could be caused by asbestos were assigned a pathos factor of „2’ by the pathologist. However, these lesions were not attributed by the pathologist to asbestos exposure as indicated in the following histology report excerpts (Appendix I):
 - Pleural lesions were seen in few of the mice, including inflammation, lymphonodular hyperplasia, some mild focal fibrosis or adhesions, and mild focal mesothelial cell hypertrophy in one mouse. These lesions were attributed to parasitism. Some of the pleural nodules may have been residual thymic nodules rather than true foci of antigenic stimulation. It is considered unlikely that the fibrosis was due to asbestosis, since the inflammatory changes were similar to those seen in other tissues. Pleural fibrosis due to asbestos exposure is accompanied by interstitial fibrosis (asbestosis), and no interstitial fibrosis was noted.
 - Hemosiderosis is a change that can be seen concurrently with asbestosis, and a few mice had small foci of hemosiderosis in the lungs; however, these foci were associated with perivascular cuffing and endothelial parasitism, and for reasons

previously stated it is likely that the hemosiderosis was due to vascular damage associated with parasitism and inflammation rather than asbestos exposure.

As discussed in the pathologist's report in Appendix I, a broad spectrum of lesions was seen in various tissues of the mice, with most of these lesions being mild, and attributed to parasitism. Parasite-host interactions evolve over time, and successful interactions beneficial to both species do not result in serious disease or death of either. Therefore, it was not surprising or unexpected that these mice, indigenous to their collection sites, were heavily parasitized but were in otherwise good health. All mice had recognizable or exuberant fat stores, indicative of adequate nutritional status.

None of the mice had evidence of a prominent stress response in the lymphoid tissues or adrenals, and none of the mice had morphologic evidence of immune suppression or dysfunction, the latter based on morphologic features of the various lymphoid tissues (spleen, lymph node and thymus). The immune response (inflammation) in the tissues of the mice also supports a functional immune system that was able to contain the effects of parasite migration and foreign body insults. Although the true age of these mice was not known (but estimated from eye lens weights), they appeared to be adults and some had obvious age-related changes such as fibrosis. It is unlikely that the lesions observed in the examined tissues would significantly alter general health status, growth or survival of the mice. The reproductive tracts were only examined opportunistically but it should be noted that all but one were histologically within normal limits and thus the pathologist considered it unlikely that the mice had compromised reproductive ability.

Overall, the pathologist's opinion (Appendix I) indicates that there is not an adequate spectrum of lesions or lesion patterns in the mice to document pathology related to asbestos exposure, and that there is adequate evidence to attribute all observed disease processes to other causes. The total animal histology scores assigned by the histologist are detailed in Appendix I and summarized for reference and OU3 animals in Figure 4-4 a,b according to broad lesion categories. These figures show the contribution of the observed lesion types to the overall animal scores. As indicated by the pathologist (Appendix I), none of the lesions illustrated in Figure 4-4 a,b were considered asbestos-related.

4.6 Statistical Analysis of Animal Histology Data

Statistical comparison of the assigned histology scores was conducted using the non-parametric Wilcoxon Rank Sum test, as required in the Phase III SAP (USEPA 2009a,b), and the frequency of each lesion was compared between the OU3 and reference areas using a Fisher's exact test. Results of statistical comparisons on an individual target tissue basis are summarized in Table 4-6 and detailed results are presented in Appendix K. Both 1- and 2-tailed tests of significance were conducted. The 2-tailed p-values test for a difference between OU3 and the reference area, while the 1-tailed p-value tests whether OU3 mice had more overall lesions than the reference area mice.

On an individual target tissue basis (Table 4-6), a statistically-higher incidence of lesions in the OU3 mice was seen in the larynx ($p = 0.02$), left bronchus ($p = 0.06$), upper respiratory tract ($p = 0.03$), right middle lung ($p=0.19$), and the entire respiratory tract ($p = 0.19$) based on the Wilcoxon Rank Sum test. The significant differences in the number of cardiac stomach lesions (2-tailed p -value = 0.09) reflects more lesions in the reference area compared to the OU3 site since the 1-tailed p -value is 0.96. The Fishers Exact test results for the respiratory organs mirror those from the Wilcoxon Rank Sum test, with OU3 mice having a higher number of lesions in the larynx ($p = 0.10$), left bronchus ($p = 0.10$), upper respiratory tract ($p = 0.12$), and the respiratory tract as a whole ($p = 0.13$) compared with the reference area mice. The results for the lower GI tract indicate more lesions in the duodenum ($p = 0.13$) and the jejunum ($p = 0.19$) for mice from the OU3 area compared with the mice from the reference area. The cardiac stomach also had significantly more lesions in the reference area compared with OU3 based on the Fishers test as well (2-tailed p -value of 0.10, 1-tailed p -value of 0.94). On a total animal score basis (Table 4-7), no statistically-significant differences (1- or 2-tailed) were observed in total animal scores between OU3 and the reference site mice. All statistically significant findings reflect the presence of lesions attributed to parasitism and disease-related processes as no asbestos-related pathology was observed.

Overall, the findings from this study indicate that no asbestos pathology was observed in animals considered highly exposed and collected from locations near the highest measured asbestos dust concentrations within OU3.

Reference Site

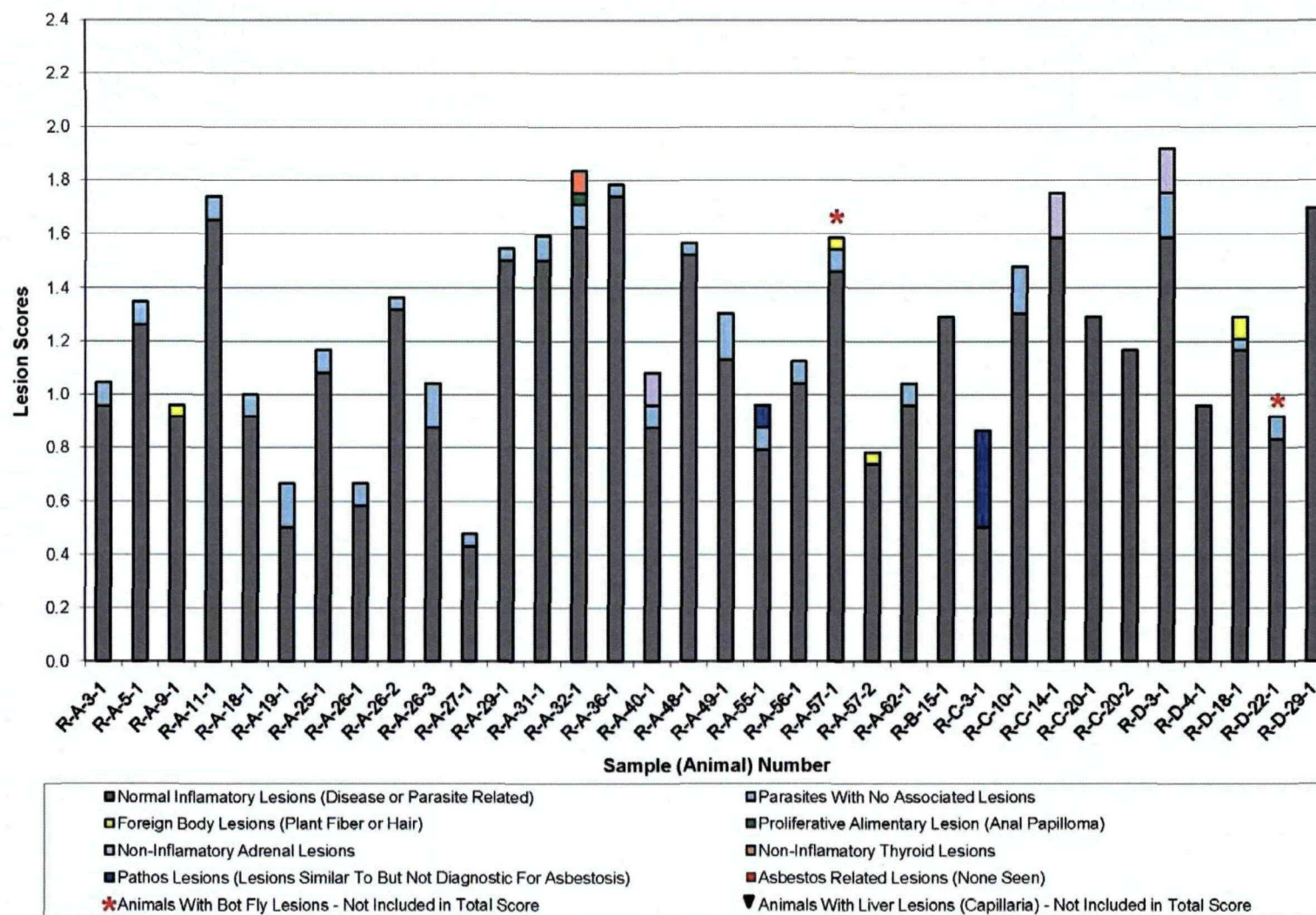


Figure 4-4a Total Animal Histology Scores for Reference Site Mice (Note: no asbestos-related lesions were observed)

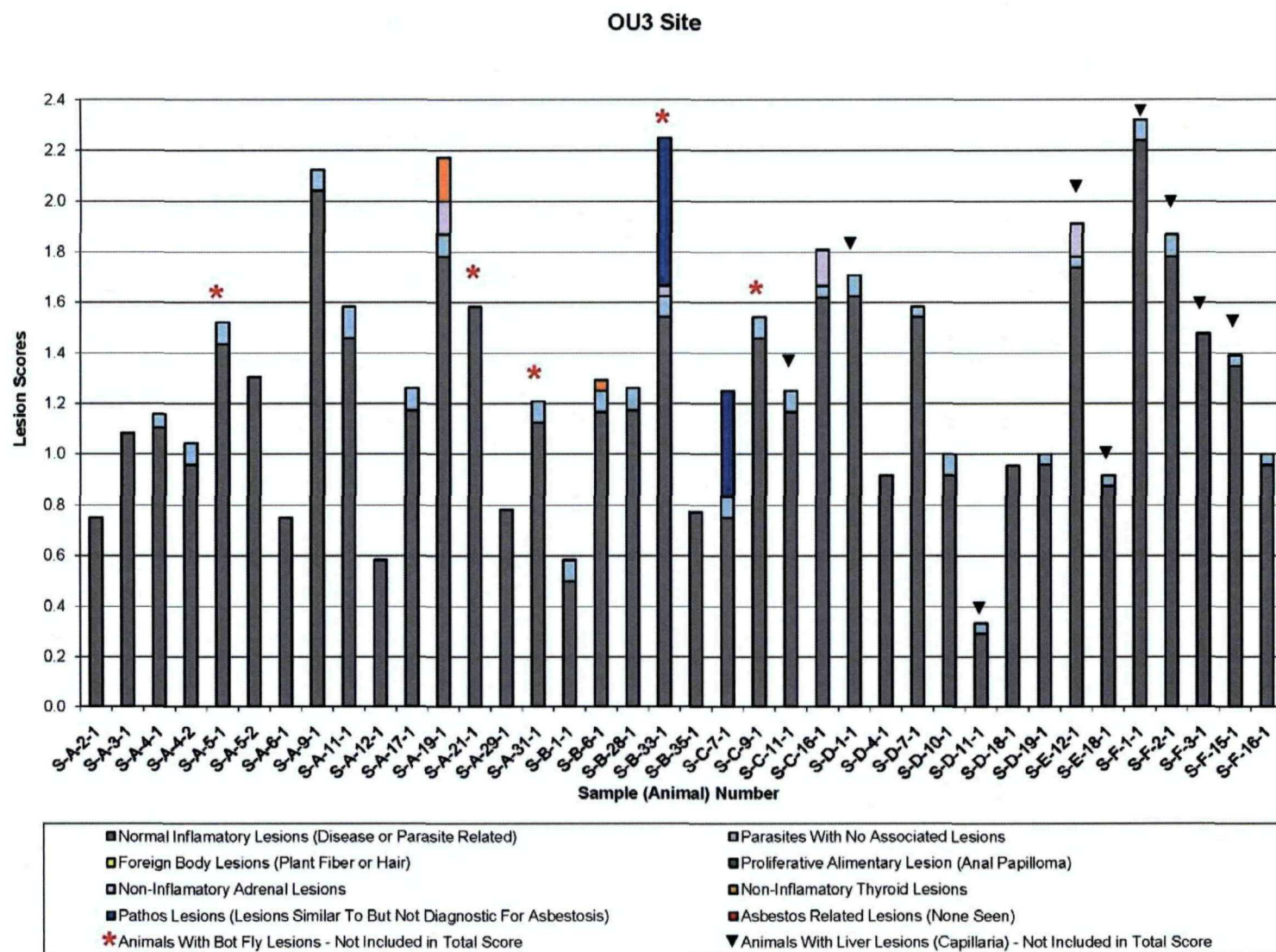


Figure 4-4b Total Animal Histology Scores for OU3 Deer Mice (Note: no asbestos-related lesions were observed)

TABLE 4-6
Mann-Whitney/Wilcoxon Rank Sum Statistics for Each Tissue

Comparison	Mann-Whitney U Test					Fisher's Exact Test	
	Mann-Whitney U	Wilcoxon Rank Sum W	Z-score	2-tailed p-value	1-tailed p-value *	2-tailed p-value	1-tailed p-value *
Larynx	451	1012	-2.171	0.03	0.02	0.16	0.10
Trachea	620	1361	-0.319	0.75	0.63	1.00	0.50
Left bronchus	429	957	-1.548	0.12	0.06	0.16	0.10
Right bronchus	454	889	-0.369	0.71	0.36	1.00	0.53
Upper respiratory tract	8014	16270	-1.855	0.06	0.03	0.20	0.12
Left cranial lung	606	1309	-0.06	0.95	0.53	0.57	0.29
Left middle lung	598	1301	-0.15	0.88	0.56	0.80	0.48
Left caudal lung	565	1268	-0.546	0.59	0.71	1.00	0.57
Right cranial lung	605	1200	-0.472	0.64	0.32	1.00	0.56
Right middle lung	569	1164	-0.891	0.37	0.19	0.55	0.30
Right caudal lung	621	1216	-0.292	0.77	0.39	0.62	0.35
Post caval lung	601	1162	-0.119	0.91	0.46	0.74	0.44
Lower respiratory tract	30225	57720	-0.274	0.78	0.39	0.72	0.37
All respiratory tract	70580	136283	-0.904	0.37	0.19	0.26	0.13
Esophagus	634	1229	-0.32	0.75	0.38	1.00	0.55
Cardiac stomach	552	1293	-1.696	0.09	0.96	0.10	0.94
Fundus	631	1226	-0.505	0.61	0.31	1.00	0.54
Pylorus	605	1308	-0.489	0.63	0.69	0.73	0.56
Upper gastrointestinal tract	9883	21359	-1.066	0.29	0.86	0.32	0.82
Duodenum	615	1210	-0.523	0.60	0.30	0.33	0.20
Jejunum	594	1189	-0.711	0.48	0.24	0.29	0.19
Ileum	609	1350	-0.583	0.56	0.72	1.00	0.55
Cecum	629	1370	-0.232	0.82	0.59	0.78	0.40
Colon	570	1311	-0.946	0.34	0.83	0.64	0.40
Rectum	641	1382	-0.156	0.88	0.56	1.00	0.65
Anus	349	755	-0.654	0.51	0.75	0.60	0.53
Lower gastrointestinal tract	29116	62012	-0.233	0.82	0.59	0.64	0.33
All gastrointestinal tract	73381	156409	-0.408	0.68	0.66	1.00	0.52
Adrenal	617	1358	-0.523	0.60	0.70	0.75	0.58
Thyroid	562	1090	-0.483	0.63	0.32	1.00	0.55

* Probability of OU3 having more lesions than the reference area, calculated as 0.5*2-tailed p-value if the OU3 value is greater than the reference area or 1-(0.5*2-tailed p-value) if the reference area value is greater than OU3.

Bold p-values denote a significant difference at the p = 0.20 level

TABLE 4-7

Mann-Whitney/Wilcoxon Rank Sum Statistics for Total Animal Histology Scores

Comparison	Mann-Whitney U	Wilcoxon Rank Sum W	Z-score	Significance, two-tailed	Significance, one-tailed*
Combined Score with Bot Fly and Liver Lesions	587	1182	-0.666	0.51	0.25
Combined Score without Bot Fly and Liver Scores	631	1226	-0.169	0.87	0.44

* Probability of OU3 having more lesions than the reference area, calculated as 0.5*2-tailed p-value if the OU3 value is greater than the reference area

5.0 CONCLUSIONS

The following are important findings/conclusions drawn from the data collected for this study.

- Target animals captured included only deer mice. Southern red-backed voles were not captured at any of the reference or OU3 trapping locations.
- A total of 72 mice were collected, including 34 from the reference site and 38 from OU3.
- Mouse necropsies and target tissue harvesting were completed according to the Phase III SAP procedures and SOPs (USEPA 2009a,b) without incident, though a larynx and thyroid from one reference animal were lost during necropsy.
- Mice were in good health and no deformities were observed in any mice. A number of mice exhibited active or past parasitic bot fly infections. Several macroscopic liver lesions from OU3 mice were submitted for identification and one spleen was also submitted from an OU3 mouse.
- The overall female-to-male ratio for the animals captured from the reference area was 1.8. Conversely, there were more males overall at OU3 and the female-to-male ratio for captured animals was 0.8. However, sex ratios between transects were variable at both the reference area and at OU3.
- Based on the average dry eye lens weight, average mouse ages by transect ranged from 96 to 316 days (three to over ten months in age).
- Histological examination by a board certified veterinary pathologist found no evidence of asbestos pathology in any target tissues or submitted lesions.
- All observed tissue lesions, including those identified herein as occurring at a statistically significantly higher rate in OU3 mice, were attributed to parasite- and disease-related inflammation.
- The pathologist indicated that all mice had recognizable or exuberant fat stores, indicative of adequate nutritional status. None of the mice had evidence of a prominent stress response in the lymphoid tissues or the adrenals examined. The pathologist further concluded that within the confines of the study design and tissues examined, the lesions observed would not alter the general health status, growth, survival or reproductive abilities of the study mice.

The findings from this study indicate that no asbestos pathology was observed in mice considered highly exposed and collected from locations near the highest measured asbestos dust concentration at OU3. The data collected in this study are sufficient to meet the identified Data Quality Objectives for the Small Mammal Study described in the Phase III SAP and Standard Operating Procedures (SOPs) (USEPA 2009a,b) and therefore, no further small mammal data collection is needed unless additional Data Quality Objectives are identified for completion of the baseline ecological risk assessment in support of an informed risk-based management decision.

6.0 REFERENCES

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APPENDIX A
RECONNAISSANCE MEMORANDUM

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TECHNICAL MEMORANDUM

Date: August 19, 2009
To: Robert Marriam, Remedium Group, Inc.
From: Sue Robinson, Parametrix
Joe Volosin, Parametrix
Subject: Small Mammal Reconnaissance Trip Report: Reference Area, Operable Unit 3,
Libby Asbestos Superfund Site
cc: Project Files
Project Number: 598-6068-001
Project Name: Small Mammal Study, Remedial Investigation, Operable Unit 3 of the Libby
Asbestos Superfund Site

INTRODUCTION

A reconnaissance trip to Libby OU3 and an upwind reference area was conducted between June 22 and June 24, 2009. In attendance were Sue Robinson, Carrie Claytor and Joe Volosin from Parametrix. The goals of the reconnaissance trip were to evaluate potential small mammal trap locations, determine the need (if any) for modifications to trapping methods and procedures as specified in the EPA Phase III Sampling and Analysis Plan (SAP), identify and mark the perimeter of the OU3 trap area, and establish terrain and trap area(s) accessibility within both the Libby Superfund Site, Operable Unit 3 (OU3) and the identified upwind (of OU3) reference area.

APPROACH

To help understand the sample area in OU3, the four soil/duff/tree bark sample points that define the corners of the small mammal sample area polygon were visited. The names and GPS coordinates for those sites are presented in Table 1. Additional locations throughout OU3 that can be used as trap locations were evaluated and the coordinates of these locations are also presented in Table 1.

As a potential reference area, the forest near Sheldon Mountain in the Kootenai National Forest was visited. The reference areas visited were all more than five miles (as the crow flies) from the SL15-02 location, which is the westernmost sample point in the OU3 small mammal sample area polygon. Coordinates for some of the key reference area locations visited are also presented in Table 1. Two potential reference locations, Ref. NW Point and Ref. East Point were originally derived from Google Earth to help guide finding the reference area.

OBSERVATIONS

The terrain in OU3 within the sampling polygon is very steep. The slope was also steep near each of the four corners of the sample area polygon. The terrain within the OU3 sample area generally included very dense shrubs and in places, dense tree growth. The OU3 locations where the terrain was not as steep were near sample areas, MOU301 and MOU302.

Table 1. OU3 and Reference Locations Evaluated during Reconnaissance Trip

Site Name	Easting	Northing	Location type
SL15-02	617648	5367516	OU3, Polygon corner point
SL45-02	618384	5367170	OU3, Polygon corner point
SL45-03	618801	5367750	OU3, Polygon corner point
SL75-03	619545	5366720	OU3, Polygon corner point
MOU301	619040	5367259	OU3, Additional point in area
MOU302	618467	5367604	OU3, Additional point in area
MOU303	617912	5367507	OU3, Additional point in area
MOU304	619522	5366709	OU3, Additional point in area
MOU305	617628	5367616	OU3, Additional point in area
MRFNW1	609230	5369918	Reference
MRFSW1	609048	5369563	Reference
MRFSW2	609124	5369703	Reference
MRFSW3	608667	5369099	Reference
MRFSW4	608459	5368977	Reference
MRFSW5	608398	5368861	Reference
MRFSW6	607835	5368438	Reference
MRFSW7	607871	5368657	Reference
MRFSW8	607540	5367894	Reference
MRFKW1	607256	5367451	Reference
MRFKW2	607183	5367290	Reference
MRFKW3	607253	5367240	Reference
MRFKW4	607350	5367434	Reference
Ref. NW Point	609242	5369986	Reference, GPS Estimated from Google Earth
Ref. East Point	610228	5369471	Reference, GPS Estimated from Google Earth

UTM NAD83, Zone 11

With the exception of locations adjacent to or in the immediate vicinity of roads and ranger-accessible paths, or where the lack of steep elevation permits deeper terrain access, much of the central area within the OU3 trap area polygon is terrain limiting and will not be trapped during the program. Trap locations established near vehicle access roads and pathways is important since field personnel must have ready access to vehicles for equipment storage and deployment and for efficient trap collection for transport back to the offsite processing laboratory.

The terrain near many of the potential upwind reference locations evaluated was also steep. The tree cover was generally greater at the reference locations than in OU3 but the shrub cover tended to be less dense. There is one potential reference area (near MRFKW2 and MRFKW4) that is not steep and is relatively open and that could be a possible backup reference location (i.e., should insufficient animals be caught at recommended reference areas). However, chipmunks and their burrows were observed in several locations throughout this backup area that would likely result in the capture of significant numbers of non-target species. Additionally, a Kootenai National Forest road (near FCC tower; road 4753A) was gated and locked which did not allow access to more forest land on Sheldon Mountain. The area behind this gate is another location that may be desirable for trapping and Parametrix is requesting that Remedium discuss gaining access with the Kootenai National Forest.

Finally, terrain limiting conditions (steepness) will also affect the placement, number and spacing of traps in both reference and OU3 areas. The Phase III SAP specified distance of 100 meters is simply considered unrealistic for the nature of the terrain conditions in both OU3 and the upwind reference areas.

RECOMMENDATIONS

It will not be possible to have complete coverage within the small mammal sample area polygon in OU3. The steepness of the terrain and the shrub density will hinder travel across the small mammal sample area. To implement the sample program, the sample locations will have to follow the logging roads within OU3 (Figure 1). General small mammal collection areas that will be used include MOU301 through MOU305 as well as the soil sample points¹, SL15-02, SL45-02, SL45-03 and SL75-02. Trap-lines will be set up on both sides of roads in these distinct locations spread throughout the small mammal sample area polygon.

Similarly, for the reference area, the trap-lines will be set up on both sides of forest roads. The trap lines will be set at distinct locations spread throughout the reference area (Figures 2 and 3).

As previously discussed, due to the density of the shrubs and steepness of the terrain the distance between traps in both the reference and OU3 locations will have to be much closer than the 100 meters specified in the Phase III SAP. A distance of 10 meters (33 feet) is recommended and considered more realistic for the terrain conditions. This distance will be appropriate for ensuring small mammal collection but would not be adequate for attempting to trap separate populations with each and every trap (Bowman et al. 2000), which is probably not necessary to meet the goals of this sampling program. However, the goal to keep the reference and OU3 populations separate will be achieved as the sample areas are more than five miles apart. It is noted that Pearson and Ruggiero (2003) had good results capturing deer mice (*Peromyscus maniculatus*) and southern red-backed voles (*Clethrionomys gapperi*) in west-central Montana when traps were set 10 meters apart using a transect method. Therefore, traps will be spaced at an interval appropriate to field terrain conditions but no closer than 15 feet apart.

In each sample area (e.g., OU3), 100 traps will be used but not more than 40 – 50 traps will be set each night. This number of traps will make trap set-up and retrieval manageable given the need to set traps close to dusk and retrieve early in the morning.

REFERENCES

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¹ Each of the four points that made the polygon were near a haul road or logging road.

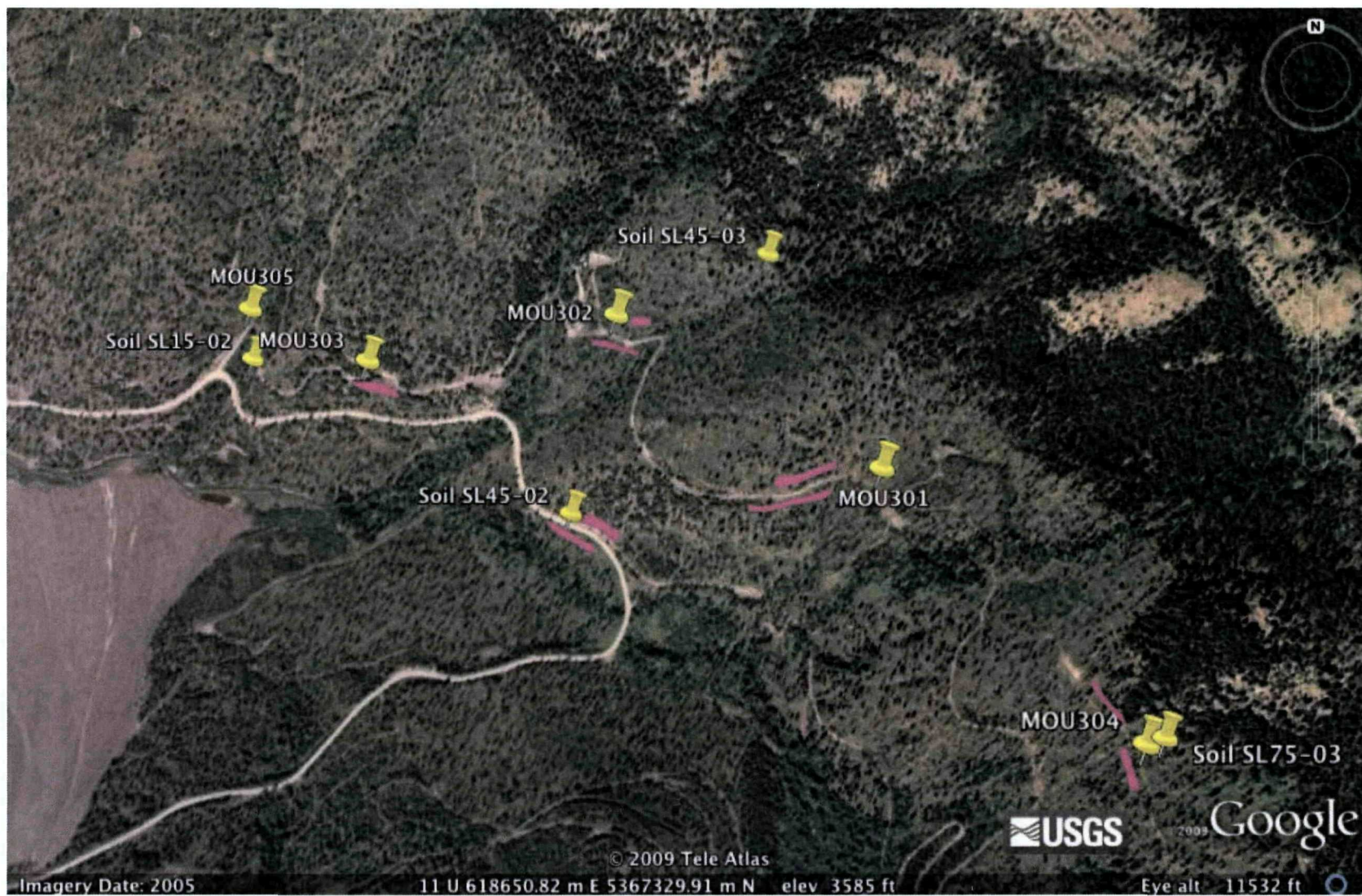


Figure 1. Small Mammal Sample Area in Libby Superfund Site, Operable Unit 3

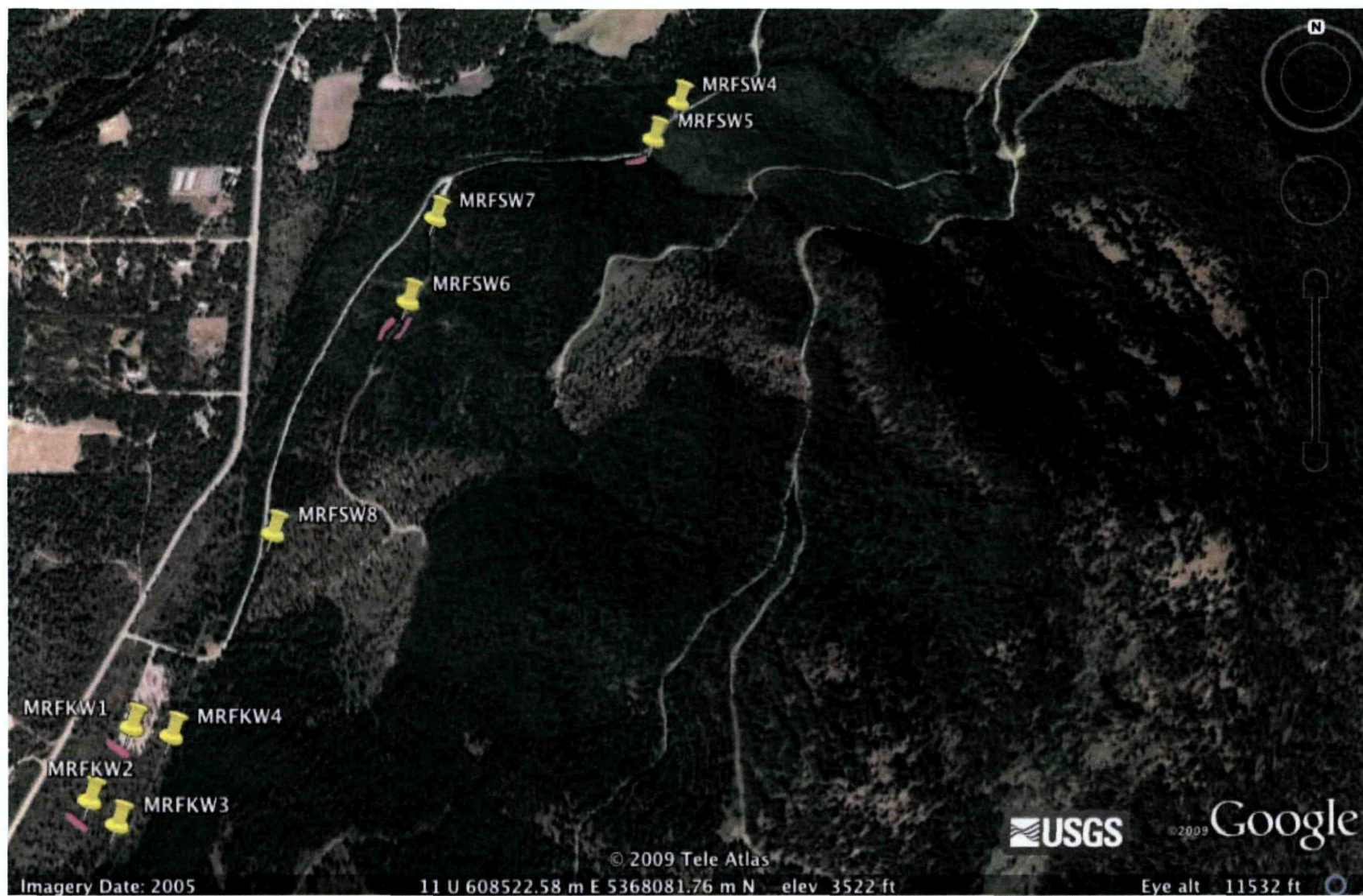


Figure 2. Small Mammal Sample Area, Reference Area 1

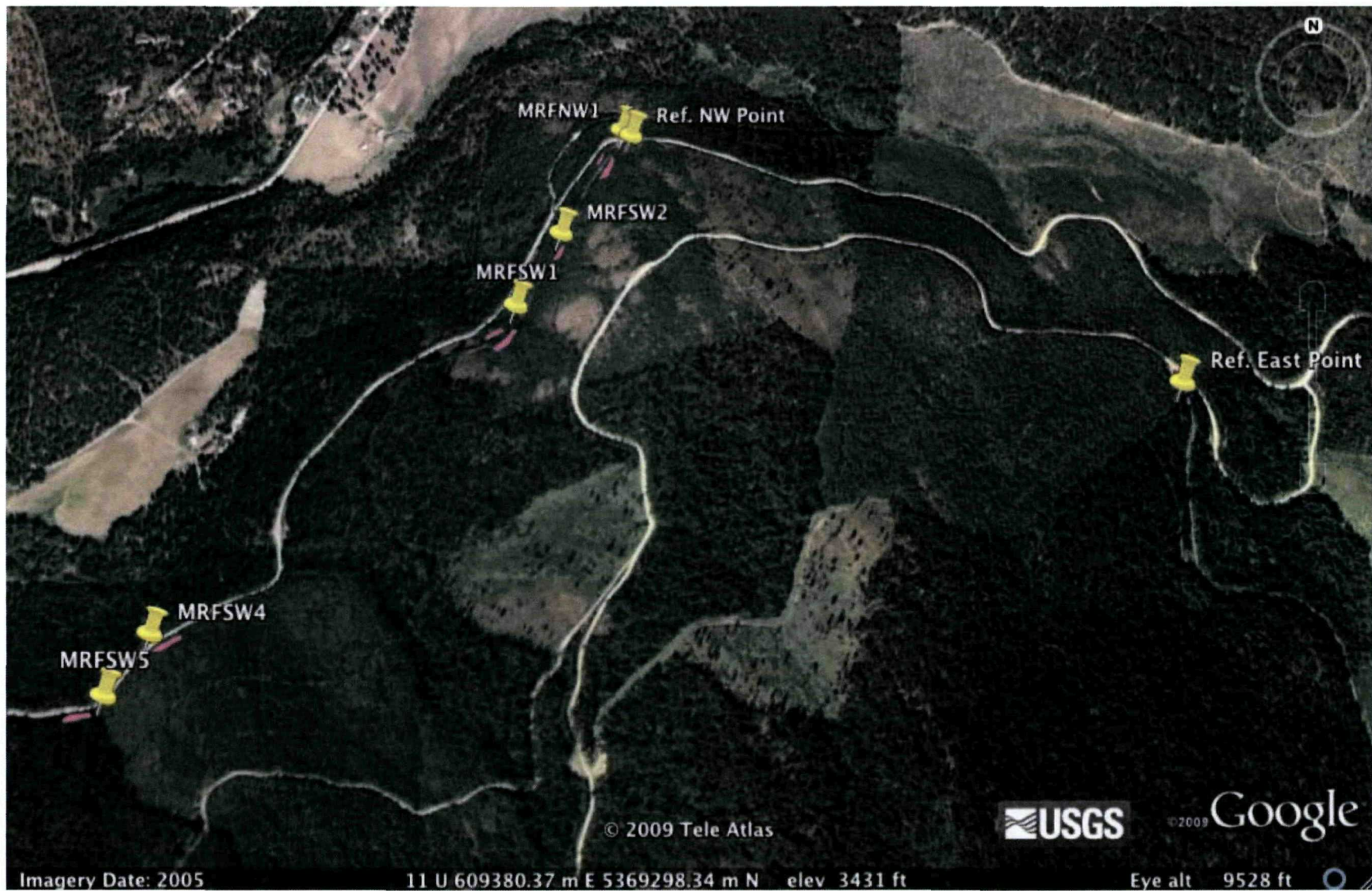


Figure 3. Small Mammal Sample Area, Reference Area 2

APPENDIX B
FSDS FORMS

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammals / Log Book 1 Logbook Page No.: 2

Necropsy Date: 08-27-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 5 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 11.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0236</u>	<u>0237</u>	<u>0235</u>	<u>0239</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0238</u>	<u>0242</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External/Internal exam - unremarkable
Pericardial membrane intact

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

2

Necropsy Date:

8/27/09

Personnel Initials:

AK

Small Mammal Field ID: SM-

R - A - 29 - 1

(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams):

20.1

(initial)

(w/o uterus if pregnant)

Sex (circle one):

(M)

F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0221</u>	<u>0223</u>	<u>0224</u>	<u>0240</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0222</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

Male peromyscusoutside unremarkable. Bot fly larvae inside

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by

GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 2

Necropsy Date: 08-27-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 27 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0228</u>	<u>0229</u>	<u>0226</u>	<u>0227</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0225</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - unremarkable Internal exam - unremarkable
Specimen - Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)

SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 2

Necropsy Date: 08-27-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 26 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 12.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:		AF	AF	AF
Vial No.:	0220	02019	02017	02016
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:	AF			
Vial No.:	02018	0230		
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External & internal exams unremarkable
species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by grw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

2

Necropsy Date:

8/27/09

Personnel Initials:

AK

Small Mammal Field ID: SM-

R - A - 11 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams):

17.1

(initial)

(w/o uterus if pregnant)

Sex (circle one):

M

F

UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0212</u>	<u>0214</u>	<u>0211</u>	<u>0213</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0215</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

unremarkable internal, externalPeromyscus

For Data Entry Completion (Provide Initials)

Completed by

S. Robinson

QC by

AK

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 2

Necropsy Date: 8-27-09 Personnel Initials: AK

Small Mammal Field ID: SM- R - A - 32 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 16.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ F ☐ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0206</u>	<u>0209</u>	<u>0208</u>	<u>0207</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0210</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal and external exam
Peromyscus

For Data Entry Completion (Provide Initials)

Completed by: S. Robinson

QC by: PRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 3

Necropsy Date: 08-27-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 40 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0205</u>	<u>0204</u>	<u>0203</u>	<u>0201</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0202</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: internal/external exam unremarkable
species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

gkw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) **SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 3

Necropsy Date: 8/27/09 Personnel Initials: AK

Small Mammal Field ID: SM- R - B - 15 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 16.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Vial No.:	0241	0234	0231	0230 0232
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Vial No.:	0233			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable exterior and interior
peromyx lung

For Data Entry Completion (Provide Initials)

Completed by: Robinson QC by AKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) **SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 8

Necropsy Date: 8/28/09 Personnel Initials: AK

Small Mammal Field ID: SM- R - D - 22 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.3 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:			TB	
Vial No.:	0290	0298	0292	0299
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	0300	0289		
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: possible bat flea larvae lesion near genital region
sample taken, photo taken. otherwise unremarkable
internal and external.

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by JH

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 8

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - D - 29 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 15.3 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0297</u>	<u>0296</u>	<u>0295</u>	<u>0294</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0293</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - unremarkable
Internal exam - unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by grw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 7

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - C - 14 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 16.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0288</u>	<u>0286</u>	<u>0287</u>	<u>0285</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0284</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal & external exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

JRH

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 7

Necropsy Date: 8/28/09 Personnel Initials: AW

Small Mammal Field ID: SM- R - C - 20 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 15.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0282</u>	<u>0271</u>	<u>0283</u>	<u>0272</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0281</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Unremarkable interior, exterior
Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

8

Necropsy Date:

08-28-09

Personnel Initials:

AF

Small Mammal Field ID: SM-

R - 0 - 4 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams):

10.7

(initial)

(w/o uterus if pregnant)

Sex (circle one):

M

F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0273</u>	<u>0277</u>	<u>0276</u>	<u>0275</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0274</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

External & internal exam unremarkableSpecies - Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

jph

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 8

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - 0 - 18 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 11.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0280</u>	<u>0279</u>	<u>0278</u>	<u>0269</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:	<u>2</u>			
Vial No.:	<u>0270</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: internal & external exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gaw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) **SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

5

Necropsy Date:

8/28/09

Personnel Initials:

SK

Small Mammal Field ID: SM-

R - A - 57 - 1[SM - station ID - transect ID - trap# - animal#]Animal Weight (grams): 20.0 (initial)

(w/o uterus if pregnant)

Sex (circle one):

M

F

UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO <u>SMI</u> LGI LNG	ESO STO SMI <u>LGI</u> LNG	ESO STO SMI LGI <u>LNG</u>
Other:				
Vial No.:	<u>0264</u>	<u>0263</u>	<u>0266</u>	<u>0267</u>
Field QC Type (circle one):	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO <u>STO</u> SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0265</u>			
Field QC Type (circle one):	<u>FS</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

unremarkable except possible bot fly lesion near
genitals. Photo taken. Entire lesion removed for histology.

PEROMYSCUS

For Data Entry Completion (Provide Initials)

Completed by S. Robinson QC by gfh

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 6

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 31 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 20.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0251</u>	<u>0261</u>	<u>0262</u>	<u>0252</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0253</u>	<u>0268</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal & External exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

5

Necropsy Date:

8/28/09

Personnel Initials:

SK

Small Mammal Field ID: SM-

R - A - 56 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams):

14.8

(initial)

(w/o uterus if pregnant)

Sex (circle one):

M ☒ F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0249</u>	<u>0260</u>	<u>0259</u>	<u>0248</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0250</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

Field ID could also be SM-R-A-54-1 (confirm w/ Joe)Peromyscusunremarkable interior, exterior

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by

grw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 2

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 26 - 2
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 11.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0256</u>	<u>0258</u>	<u>0257</u>	<u>0255</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0254</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal & External exam unremarkable
Specimen = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AF</u>	QC by <u>gsh</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 5

Necropsy Date: 08-28-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 38 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 20.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0246</u>	<u>0245</u>	<u>0243</u>	<u>0247</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0244</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam unremarkable
Internal - stomach blue, very full of blue-black material,
possibly debris?
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 14

Necropsy Date: 8/29/09 Personnel Initials: AK

Small Mammal Field ID: SM- R - C - 3 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 12.4 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0369</u>	<u>0315</u>	<u>0347</u>	<u>0346</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:		<u>TB</u>		
Vial No.:	<u>0359</u>	<u>0398</u>		
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: peromyscus unremarkable exterior, interior

For Data Entry Completion (Provide Initials)	Completed by <u>S. Robinson</u>	QC by <u>JRW</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 13

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - C - 10 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 17.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0360</u>	<u>0358</u>	<u>0349</u>	<u>0357</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0356</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/external exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gkw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 12

Necropsy Date: 8/29/09 Personnel Initials: AK

Small Mammal Field ID: SM- R - D - 3 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 15.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0317</u>	<u>0318</u>	<u>0396</u>	<u>0316</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0371</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal, external
Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 13

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - C - 20 - 2
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0331</u>	<u>0321</u>	<u>0322</u>	<u>0323</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0332</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exam: Unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

gpc

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 10

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 48 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 180 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0336</u>	<u>0337</u>	<u>0333</u>	<u>0334</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI <u>LNG</u>	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0335</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gaw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 10

Necropsy Date: 8/29/09 Personnel Initials: Kup

Small Mammal Field ID: SM- R - A - 49 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 19.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0327</u>	<u>0310</u>	<u>0330</u>	<u>0320</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0328</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Peromyscus

Unremarkable internal, external

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by JRH

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 11

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 19 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0395</u>	<u>0340</u>	<u>0350</u>	<u>0339</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0338</u>	<u>0319</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

QC by

AF gln

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 11

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 3 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 10.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0326</u>	<u>0392</u>	<u>0397</u>	<u>0398</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0327</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/external exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JKW

**LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 10

Necropsy Date: 8/27/09 Personnel Initials: SEP

Small Mammal Field ID: SM- R - A - 62 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 20.0 (initial) Bit larvae weight 0.4g (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0291</u>	<u>0301</u>	<u>0302</u>	<u>0304</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0303</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Bot fly larvae (saved); otherwise
unremarkable external, internal
Peromyscus

For Data Entry Completion (Provide Initials)	Completed by <u>S. P. Johnson</u>	QC by <u>JPW</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 10

Necropsy Date: 08-29-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 57 - 2
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 17.0 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0308</u>	<u>0305</u>	<u>0309</u>	<u>0307</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0306</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal exam - penis enlarged with a blood clot
(hematoma) just under the bladder.
External exam - unremarkable.
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gaw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

17

Necropsy Date:

08-30-09

Personnel Initials:

AF

Small Mammal Field ID: SM-

R - A - 18 - 1

(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams):

13.0

(initial)

(w/o uterus if pregnant)

Sex (circle one):

(M)

F

UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0314</u>	<u>0344</u>	<u>0312</u>	<u>0313</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0311</u>	<u>0351</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

Adrenals very small; left adrenal red
External exam unremarkableSpecies = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 16

Necropsy Date: 8/30/09 Personnel Initials: AK

Small Mammal Field ID: SM- R - A - 25 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 13.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0366</u>	<u>0385</u>	<u>0383</u>	<u>0386</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0384</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremountable internal and external

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robins

QC by

JKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 16

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 26 - 3
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 18.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0361</u>	<u>0364</u>	<u>0365</u>	<u>0362</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0363</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal / External Exam unremarkable
Specimen = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gfv

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 16Necropsy Date: 8/30/09 Personnel Initials: AKRSmall Mammal Field ID: SM- R - A - 55 - 1
(SM - station ID - transect ID - trap# - animal#)Animal Weight (grams): 13.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0391</u>	<u>0381</u>	<u>0370</u>	<u>0393</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0394</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Male peromyscus unremarkable interior, exterior

For Data Entry Completion (Provide Initials)

Completed by S. RobinsonQC by JKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 17

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- R - A - 9 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 11.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0367</u>	<u>0379</u>	<u>0368</u>	<u>0380</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0378</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exam unremarkable
lost trachea during dissection - NOT collected
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

QC by

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)

SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 19

Necropsy Date: 8/30/09 Personnel Initials: [Signature]

Small Mammal Field ID: SM- 5 - B - 28 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 12.3 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0571</u>	<u>0568</u>	<u>0562</u>	<u>0561</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:		<u>TB</u>		
Vial No.:	<u>0572</u>	<u>0573</u>		
Field QC Type (circle one):	(FS) FD TB	FS FD (TB)	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal and external

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Rodriguez

QC by [Signature]

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 19

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - B - C - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.9 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0563</u>	<u>0566</u>	<u>0565</u>	<u>0567</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0564</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External/Internal exam = unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gkh

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 29 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0373</u>	<u>0372</u>	<u>0389</u>	<u>0375</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0374</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal / External exam: unremarkable

Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

AF

QC by

JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) **SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 8/30/09 Personnel Initials: SK

Small Mammal Field ID: SM- S - A - 21 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0387</u>	<u>0399</u>	<u>0400</u>	<u>0388</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0390</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: lesion near anus - fatty, opening to external
environment on lesion. Photo & sent to histologist.
peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robins

QC by GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 12 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 15.9 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0355</u>	<u>0342</u>	<u>0345</u>	<u>0343</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0325</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/external exams unremarkable

Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - A - 4 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 14.0 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0354</u>	<u>0382</u>	<u>0376</u>	<u>0592</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0591</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal / External exams - unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JH

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

18

Necropsy Date:

8/30/07

Personnel Initials:

AK

Small Mammal Field ID: SM-

S - A - 5 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams):

19.8

(initial)

(w/o uterus if pregnant)

Sex (circle one):

(M)

F

UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0377</u>	<u>0358</u>	<u>0341</u>	<u>0324</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0353</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

lesion near anus: photo taken, sampled for histology
otherwise unremarkable internal, externalpericardium

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by

AK

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 11 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 18.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0597</u>	<u>0594</u>	<u>0593</u>	<u>0596</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0595</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: external exam - bot in groin area
internal exam - bot in groin - mature luma. Spleen
appears enlarged
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

QC by

AF GRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) **SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID:

Mammal Log Book 1

Logbook Page No.:

19

Necropsy Date:

8/30/07

Personnel Initials:

JS

Small Mammal Field ID: SM-

S - B - 33 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams):

16.9

(initial)

(w/o uterus if pregnant)

Sex (circle one):

M ☒ F ☐ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0581</u>	<u>0600</u>	<u>0598</u>	<u>0599</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0582</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments:

2 lesions abrest the anus. Likely bot. Photos taken. 1 lesion had a small larva. Both lesions sent for histology. Otherwise unremarkable internal and external.

PEROMYSCUS

For Data Entry Completion (Provide Initials)

Completed by S. RobQC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 19

Necropsy Date: 08-30-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - B - 35 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 10.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0585</u>	<u>0587</u>	<u>0586</u>	<u>0583</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>AF 0584</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/external exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AF</u>	QC by <u>grw</u>
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**LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 19

Necropsy Date: 08.30.09 Personnel Initials: AF

Small Mammal Field ID: SM- S - B - 1 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 13.0 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0578</u>	<u>0577</u>	<u>0576</u>	<u>0575</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0574</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External/Internal exams unremarkable

Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 18

Necropsy Date: 8/30/09 Personnel Initials: AK

Small Mammal Field ID: SM- 5 - A - 6 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 13.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0589</u>	<u>0590</u>	<u>0579</u>	<u>0588</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0580</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal and external
Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)

SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 23

Necropsy Date: 8/31/09 Personnel Initials: AK

Small Mammal Field ID: SM- 5 - C - 7 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 12.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0497</u>	<u>0491</u>	<u>0493</u>	<u>0494</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:		<u>TB</u>		
Vial No.:	<u>0496</u>	<u>0495</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Unremarkable internal, external

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robins

QC by

gnw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 23

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - C - 11 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 17.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0497</u>	<u>0499</u>	<u>0500</u>	<u>0510</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0498</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: external exam unremarkable
internal exam. white spot on one liver lobe - put
into cassette + formalin
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by YRh

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 23

Necropsy Date: 8/31/09 Personnel Initials: AKP

Small Mammal Field ID: SM- 5 - C - 9 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 17.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0503</u>	<u>0502</u>	<u>0504</u>	<u>0501</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0511</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: lesion near anus (likely bat fly) that are infected with
pus. Photos (external) taken. Tissue of lesion submitted for
histology. otherwise unremarkable internal, external.
Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by gfh

**LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 23

Necropsy Date: 08.31.09 Personnel Initials: AT

Small Mammal Field ID: SM- S - C - 16 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 17.0 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0507</u>	<u>0508</u>	<u>0509</u>	<u>0505</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0506</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: 2 bat larvae: one mature, in crown. One immature
on upper rt arm (over the triceps muscle)
Internal organ = unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AT

QC by gkh

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 22

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 5 - 2
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 16.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0516</u>	<u>0512</u>	<u>0515</u>	<u>0514</u>
Field QC Type (circle one):	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0513</u>			
Field QC Type (circle one):	<u>FS</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by GRW

**LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 22

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - A - 2 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0530</u>	<u>0520</u>	<u>0518</u>	<u>0517</u>
Field QC Type (circle one):	(FS) FD TB	(FS) FD TB	(FS) FD TB	(FS) FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0519</u>			
Field QC Type (circle one):	(FS) FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/external exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by grw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 8/31/09 Personnel Initials: [Signature]

Small Mammal Field ID: SM- 5 - 0 - 18 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 13.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0528</u>	<u>0526</u>	<u>0527</u>	<u>0529</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0525</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal, external

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. B. [Signature]

QC by [Signature]

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - D - 10 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 11.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:	<u>CAF</u>			
Vial No.:	<u>0522</u>	<u>0521</u>	<u>0532</u>	<u>0531</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0523</u>	<u>0524</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal / External exams unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by GRW

**LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS**

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 8/31/09 Personnel Initials: AP

Small Mammal Field ID: SM- 5 - D - 19 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 11.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0535</u>	<u>0533</u>	<u>0536</u>	<u>0534</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0537</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal and external.

PEROMYSCUS

For Data Entry Completion (Provide Initials)

Completed by S. Perkins

QC by gkw

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - D - 11 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M / F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0535</u>	<u>0538</u>	<u>0549</u>	<u>0540</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0550</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - unremarkable
Internal exam - one liver lobe white & fibrotic - looking
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by gkn

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21Necropsy Date: 8/31/09 Personnel Initials: AKSmall Mammal Field ID: SM- 5 - 0 - 1 - 1
[SM - station ID - transect ID - trap# - animal#]Animal Weight (grams): 16.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0547</u>	<u>0548</u>	<u>0544</u>	<u>0545</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0546</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Liver w/ fatty looking lesions. Samples taken for histology. otherwise unremarkable internal, externalPeromyscus

For Data Entry Completion (Provide Initials)

Completed by S. RobinsonQC by JKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - D - 4 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 11.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0543</u>	<u>0541</u>	<u>0542</u>	<u>0552</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0551</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal / External exam unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal log book 1 Logbook Page No.: 22

Necropsy Date: 8/31/07 Personnel Initials: AR

Small Mammal Field ID: SM- 5 - A - 3 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 15.7 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0570</u>	<u>0569</u>	<u>0557</u>	<u>0560</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0557</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: unremarkable internal, external

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 21

Necropsy Date: 08-31-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - 0 - 7 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 16.5 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0556</u>	<u>0555</u>	<u>0558</u>	<u>0553</u>
Field QC Type (circle one):	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI <u>LNG</u>	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0554</u>			
Field QC Type (circle one):	<u>FS</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External Exam unremarkable
Species - Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JRW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 26

Necropsy Date: 09-01-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - A - 9 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 16.4 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0455</u>	<u>0453</u>	<u>0451</u>	<u>0454</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0452</u>	<u>0457</u>		
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - Sm but in (2) grains 0.2g
Internal exam: Unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

QC by

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 26Necropsy Date: 09-01-09 Personnel Initials: AFSmall Mammal Field ID: SM- 5 - A - 4 - 2
[SM - station ID - transect ID - trap# - animal#]Animal Weight (grams): 14.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0467</u>	<u>0469</u>	<u>0466</u>	<u>0468</u>
Field QC Type (circle one):	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB	<u>FS</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI <u>LNG</u>	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0470</u>			
Field QC Type (circle one):	<u>FS</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Internal/External exam unremarkable

Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AF</u>	QC by <u>gfw</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 25

Necropsy Date: 9/1/09 Personnel Initials: AK

Small Mammal Field ID: SM- S - F - 1 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 20.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0478</u>	<u>0477</u>	<u>0479</u>	<u>0476</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:	<u>LIVER LESION</u>			
Vial No.:	<u>0456</u>	<u>0480</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Significant lesions "fatty/fibrotic" throughout entire liver.
Sample of liver lesion for asbestos; entire liver submitted for histology.
Spleen lesion submitted for histology (for small for asbestos).
Photos of liver and spleen lesions. Discoloration beneath omentum; tried to
get discoloration with rectum removal for histology (part of large intestine).
providing scus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by JKW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 26

Necropsy Date: 09-01-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 17 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 17.1 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ F ☐ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0462</u>	<u>0461</u>	<u>0464</u>	<u>0463</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0465</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - but in 1.0g
Internal exam - spleen appears enlarged
Spleen - Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JBW

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 26

Necropsy Date: 08-01-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - A - 19 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 23.7 (initial) _____ (w/o uterus if pregnant) Sex (circle one): M (F) UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0472</u>	<u>0475</u>	<u>0473</u>	<u>0474</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0471</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - unremarkable
Internal Exam - lots of food in stomach
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JEN

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 26

Necropsy Date: 9/1/09 Personnel Initials: RA

Small Mammal Field ID: SM- S - A - 31 - 1
Larvae weight 0.2g [SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 16.2 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0482</u>	<u>0483</u>	<u>0484</u>	<u>0481</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0485</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: Bot fly lesion and live larvae. Larvae and lesion tissue sampled. Photos of larvae and external lesion.
otherwise, unremarkable internal, external.

Peromyscus

For Data Entry Completion (Provide Initials)

Completed by S. Robinson

QC by gph

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 25

Necropsy Date: 09-01-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - F - 2 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 14.8 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0487</u>	<u>0490</u>	<u>0488</u>	<u>0489</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0486</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - unremarkable
Internal exam - liver surface rough. Some white spots on
2 lobes. Saved tissues in formalin & photographed
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JKh

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 29

Necropsy Date: 09-02-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - E - 12 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 15.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0423</u>	<u>0421</u>	<u>0422</u>	<u>0434</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0433</u>	<u>0435</u>		
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD <u>(TB)</u>	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - small empty gut sac in @ groin
Internal exam - white spots on liver; friable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AF</u>	QC by <u>GRW</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 29

Necropsy Date: 09-02-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - E - 18 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 19.3 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0437</u>	<u>0436</u>	<u>0438</u>	<u>0440</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0439</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam unremarkable
Internal exam - liver completely involved with tissue throughout. Several pieces in formalin
Specimen - Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by AF

QC by JRVV

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 28

Necropsy Date: 09-02-09 Personnel Initials: AE

Small Mammal Field ID: SM- 5 - F - 16 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 15.1 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				<u>043/1</u>
Vial No.:	<u>0443</u>	<u>0432</u>	<u>0442</u>	<u>0431</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0441</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam - old bot cyst - in @ grain filled w/ pus
Internal exam - unremarkable
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AE</u>	QC by <u>GLW</u>
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LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 28

Necropsy Date: 09-02-09 Personnel Initials: AF

Small Mammal Field ID: SM- S - F - 15 - 1
(SM - station ID - transect ID - trap# - animal#)

Animal Weight (grams): 12.6 (Initial) _____ (w/o uterus if pregnant) Sex (circle one): M ☒ F ☐ UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0448</u>	<u>0444</u>	<u>0447</u>	<u>0445</u>
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0446</u>			
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: External exam unremarkable

Internal exam - liver normal color & texture, but lots of white nodules throughout. Saved in formalin.

Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)

Completed by

QC by

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS) SMALL MAMMAL TISSUE COLLECTION FOR TEM ANALYSIS

Field Logbook ID: Mammal Log Book 1 Logbook Page No.: 28

Necropsy Date: 09-02-09 Personnel Initials: AF

Small Mammal Field ID: SM- 5 - F - 3 - 1
[SM - station ID - transect ID - trap# - animal#]

Animal Weight (grams): 14.6 (initial) _____ (w/o uterus if pregnant) Sex (circle one): (M) F UNK

	TISSUE #1	TISSUE #2	TISSUE #3	TISSUE #4
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0459</u>	<u>0458</u>	<u>0450</u>	<u>0460</u>
Field QC Type (circle one):	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB	<u>(FS)</u> FD TB

	TISSUE #5	TISSUE #6	TISSUE #7	TISSUE #8
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:	<u>0449</u>			
Field QC Type (circle one):	<u>(FS)</u> FD TB	FS FD TB	FS FD TB	FS FD TB

	TISSUE #9	TISSUE #10	TISSUE #11	TISSUE #12
Tissue Type (circle one):	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG	ESO STO SMI LGI LNG
Other:				
Vial No.:				
Field QC Type (circle one):	FS FD TB	FS FD TB	FS FD TB	FS FD TB

Sex Descriptors: M = male; F = female; UNK = unknown (cannot determine sex)

Tissue Type Descriptors: ESO = esophagus; STO = stomach; SMI = small intestine; LGI = large intestine; LNG = lung

Field QC Type Descriptors: FS = Field Sample; FD = Field Duplicate; TB = Tissue Blank

Comments: external exam unremarkable
Internal exam - liver w/ rough surface & white nodules. Saved in formalin
Species = Peromyscus maniculatus

For Data Entry Completion (Provide Initials)	Completed by <u>AF</u>	QC by <u>JRW</u>
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APPENDIX C
SMALL MAMMAL TRAPPING LOGBOOK

Libby Superfund Site Operable Unit 3 Standard Operating Procedure

Page 7 of 2

Transsect A
Station ID: Reference LIBBY OU3: Small Mammal Trapping Log (Rev 1)
Field Logbook ID: Libby OU3 Logbook Page No.: 2 of 3

Collection Date/Time [mm/dd/yy hh:mm]	Transect ID	Trap #	Animal # [see Note 1]	Genus/Species [see Note 2]	Lifestage (circle one)	Captured Alive (A) Dead (D)	Notes of Field-Observed Physical Abnormalities (if any)
08/21/09 08:25	SM-R-A	5	1	DEMO	JV IM SA AD OA	A	None, SA juv
08/22/09 08:25	SM-R-A	11	1	DEMO	JV IM SA AD OA	A	None
08/27/09 08:27	SM-R-A	26	1	DEMO	JV IM SA AD OA	A	None
08/27/09 08:28	SM-R-A	27	1	DEMO	JV IM SA AD OA	A	None
08/27/09	SM-R-A	29	1	DEMO	JV IM SA AD OA	A	None 08:20
08/27/09	SM-R-A	32	1	DEMO	JV IM SA AD OA	A	None
08/27/09	SM-R-A	40	1	DEMO	JV IM SA AD OA	A	None juv 08:32
08/28/09	SM-R-A	57	1	DEMO	JV IM SA AD OA	A	None 07:33
08/28/09	SM-R-A	56	1	DEMO	JV IM SA AD OA	A	" 7:34
08/28/09	SM-R-A	36	1	DEMO	JV IM SA AD OA	A	" 7:46
08/28/09	SM-R-A	31	1	DEMO	JV IM SA AD OA	A	None 7:53
08/28/09	SM-R-A	26	2	DEMO	JV IM SA AD OA	A	
08/29/09	SM-R-A	62	1	DEMO	JV IM SA AD OA	A	None 7:42
08/29/09	SM-R-A	57	2	DEMO	JV IM SA AD OA	A	None 7:45
08/29/09	SM-R-A	49	1	DEMO	JV IM SA AD OA	A	
08/29/09	SM-R-A	70	1	DEMO	JV IM SA AD OA	A	
08/29/09	SM-R-A	25	1	VPCN	JV IM SA AD OA	A	None 8:03

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Libby Superfund Site Operable Unit 3 Standard Operating Procedure

Page 2 of 2

Station ID: Transsect A LIBBY OU3: Small Mammal Trapping Log (Rev 1)
 Field Logbook ID: Month: February Logbook Page No.: 11, 15, 16

Collection Date/Time (mm/dd/yy hh:mm)	Transsect ID	Trap #	Animal # [see Note 1]	Genus/Species [see Note 2]	Lifestage (circle one)	Captured Alive (A) Dead (D)	Notes of Field-Observed Physical Abnormalities (if any)
08/27/09	SM-A-A	19	1	DEMO	JV IM SA	A	None observed
08/27/09	SM-A-A	3	1	DEMO	JV IM SA	A	None observed
08/30/09	SM-A-A	55	1	YPCM	JV IM SA	A	None as seen before
08/30/09	SM-A-A	53	1	DEMO	JV IM SA	A	None observed
08/30/09	SM-A-A	50	1	YPCM	JV IM SA	A	" "
08/30/09	SM-A-A	30	1	YPCM	JV IM SA	A	" "
08/30/09	SM-A-A	29	1	YPCM	JV IM SA	A	" "
08/30/09	SM-A-A	26	3	DEMO	JV IM SA	A	" "
08/30/09	SM-A-A	25	1	DEMO	JV IM SA	A	" "
08/30/09	SM-A-A	18	1	DEMO	JV IM SA	A	" "
08/30/09	SM-A-A	9	1	DEMO	JV IM SA	A	" "
					JV IM SA		
					AD IM SA		
					AD IM SA		
					JV IM SA		
					AD IM SA		
					JV IM SA		
					AD IM SA		
					JV IM SA		
					AD IM SA		

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

[illegible]

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Station ID: Rocky

Field Logbook ID: Memorial Field Log Book #1

Logbook Page No.: 7, 13, 14

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Transcript D
LIBBY OU3: Small Mammal Trapping Log (Rev 1)
Station ID: Reference Field Logbook ID: Mammal Field Logbook Logbook Page No.: 6

[illegible]

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Libby Superfund Site Operable Unit 3 Standard Operating Procedure

Page 1 of 3

Station ID: OU-3 LIBBY OU3: Small Mammal Trapping Log (Rev 1)
Field Logbook ID: Libby Superfund Site Logbook Page No.: 18, 22, 26

Collection Date/Time [mm/dd/yy hh:mm]	Transect ID	Trap #	Animal # [see Note 1]	Genus/Species [see Note 2]	Lifestage (circle one)	Captured Alive (A) Dead (D)	Notes of Field-Observed Physical Abnormalities (if any)
09/30/09	SM-SA	04	1	DEMO	JV IM SA AD OA	A	None 09:18
09/30/09	SM-SA	5	1	DEMO	JV IM SA AD OA	A	None 09:22
09/30/09	SM-SA	6	1	DEMO	JV IM SA AD OA	A	None 09:27
09/30/09	SM-SA	11	1	DEMO	JV IM SA AD OA	A	09:34
09/30/09	SM-SA	12	1	DEMO	JV IM SA AD OA	A	09:37
09/30/09	SM-SA	21	1	DEMO	JV IM SA AD OA	A	09:50
09/30/09	SM-SA	29	1	DEMO	JV IM SA AD OA	A	10:00
09/31/09	SM-SA	2	1	DEMO	JV IM SA AD OA	A	None 8:25
09/31/09	SM-SA	3	1	DEMO	JV IM SA AD OA	A	8:30
09/31/09	SM-SA	4	1	WPCMU	JV IM SA AD OA	A	8:35
09/31/09	SM-SA	5	1	DEMO	JV IM SA AD OA	A	8:37
09/31/09	SM-SA	13	1	WPCMU	JV IM SA AD OA	A	8:44
09/11/09	SM-SA	4	1	DEMO	JV IM SA AD OA	A	None Obs 8:38
09/11/09	SM-SA	8	1	WPCMU	JV IM SA AD OA	A	8:42
09/11/09	SM-SA	9	1	DEMO	JV IM SA AD OA	A	8:44
09/11/09	SM-SA	14	1	WPCMU	JV IM SA AD OA	A	None Obs 8:49
09/11/09	SM-SA	17	1	DEMO	JV IM SA AD OA	A	8:52

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

[illegible]

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

[illegible]

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Station ID: 04-3

Field Logbook ID: Moan. 12-1
Book 11

Logbook Page No.: 23

[illegible]

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Station ID: Trans 2nd D
OU-3

Field Logbook ID: 20, Box 51

Logbook Page No.: 21

[illegible]

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

[illegible]

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

Station ID: 04-3

Field Logbook ID: 161 Book 29

Logbook Page No.: 25

Notes:

Age Categories: JV = juvenile; IM = immature; SA = sub-adult; AD = adult; OA = old adult

[1] If multiple animals are collected from the same trap, they should be assigned unique sequential identifiers.

[2] See SOP MAMMAL-LIBBY-OU3 for species identifier codes; some mammals may not be identifiable to species (record genus).

APPENDIX D
FIELD LOGBOOK

08/26/09
15:00

Reference Area

Transect A "Berm Road"
Number of Traps 43 on A

Position	North end of Transect A
11 U	0609214
UTM	5369886

Position	South end of Transect A
11 U	0609136
UTM	5369724

Reference Area

Transect B "Shooting Range"
Number of Traps 32 on B

Position	North End of Transect B
11 U	0607886
UTM	5368647

Position	South End of Transect B
11 U	06078586
UTM	5368511

End 16:01

Generally Sunny and Hot
Today

09/27/09

(2)

Transsect Drawings at end of all records
 Richardson Transsect A
 First Set

Trap	Animal	Status	GPS	needed
SM-R-A-1		knocked over		
SM-R-A-2		Open F		
SM-R-A-3		Open F		
SM-R-A-4		Open F		
SM-R-A-5	DEMO	Capture	0609211	5369865
SM-R-A-6		Open F		
SM-R-A-7		Open F		
SM-R-A-8		Open F		
SM-R-A-9		Open F		
SM-R-A-10		Open F		
SM-R-A-11	DEMO	Capture	0609197	5369853
SM-R-A-12		Closed F		
SM-R-A-13		Open F		
SM-R-A-14		Open F		
SM-R-A-15		Open F		
SM-R-A-16		Open F		
SM-R-A-17		Open F		
SM-R-A-18		Open F		
SM-R-A-19		Open F		
SM-R-A-20		Open F		
SM-R-A-21		Open F		
SM-R-A-22		Open F		
SM-R-A-23		Open F		
SM-R-A-24		Open F		
SM-R-A-25		Open F		
SM-R-A-26	DEMO	Capture	0609168	5369799
SM-R-A-27	DEMO	Capture	0609165	5369782
SM-R-A-28		Open F		
SM-R-A-29	DEMO	Capture	0609159	5369773
SM-R-A-30		Open F		
SM-R-A-31		Open F		
SM-R-A-32	DEMO	Capture	0609157	5369760

F = Fossil

08/27/09

Reference Transsect A

Trap	Animal	Status	GPS
SM-R-A-33		Open F	
SM-R-A-34		Closed F	
SM-R-A-35		Open F	
SM-R-A-36		Closed F	
SM-R-A-37		Open F	
SM-R-A-38		Open F	
SM-R-A-39		Open F	
SM-R-A-40	DEMO	Capture	0609141 5369726
SM-R-A-41		Open F	
SM-R-A-42		Open F	
SM-R-A-43		Open F	

Trap	Reference	Animal	Transsect	Status	GPS	First Set
SM-R-B-1		BTWR		Capture	0607891	5368638
SM-R-B-2				Open F		
SM-R-B-3				Open F		
SM-R-B-4				Open F		
SM-R-B-5				Open F		
SM-R-B-6		Crick		Capture		
SM-R-B-7				Open F		
SM-R-B-8				Closed F		
SM-R-B-9				Open F		
SM-R-B-10				Closed F		
SM-R-B-11				Open F		
SM-R-B-12				Open F		
SM-R-B-13				Closed		
SM-R-B-14				Open F		
SM-R-B-15		DEMO		Capture	0607888	5368601
SM-R-B-16				Closed F		
SM-R-B-17		YPCM		Capture	0607882	5368566
SM-R-B-18				Open F		
SM-R-B-19				Open F		
SM-R-B-20				Closed F		
SM-R-B-21				Open F		
SM-R-B-22				Open F		
SM-R-B-23				Open F		

F = Foul

(4)

08/27/09

Tray	Animal	Drawings at end of AM	GPJ
SM-R-B-24		Open F	
SM-R-B-25		Open F	
SM-R-B-26		Closed F	
SM-R-B-27		Open F	
SM-R-B-28		Closed F	
SM-R-B-29	4PCM	Capture	0607864 5368511
SM-R-B-30		Open F	
SM-R-B-31		Open F	
SM-R-B-32		Open F	

→ Generally Had today

08/27/09 14:30 Mon.
 "North" end of Transect C

11 U 060856 536 8078

"South" end of Transect C
 11 U 608677 536 8012

Open Canopy more m. Air Filter
 Fir / Pine

Twenty-six Traps set

08/27/09 16:15 Mon.
 "North" End Transect D
 11 U 609145 536 9981

"South" End Transect D
 11 U 609101 536 9869

Thirty-two Traps set
 Removed all at Transect B to
 Set D.

(5)

Reduction 08/27/09
 Transsect A Reset
 With add on's Add 18 traps
 now 59 traps on transect

New "South" End of Transsect A
 11 W 609098 5369655
 Hot today, Sunny

Reference 08/28/09
 Transsect A, Second Night/Day
 07:28 "Second Set"

Trip	Animal	Status	GPS
SM-R-A-59		Open F	
SM-R-A-58		Open F	
SM-R-A-57	DEMO	Capture	11W 609109 5369664
SM-R-A-56	DEMO	Capture	609107 5363869
SM-R-A-55		Open F	
SM-R-A-54		Open F	
SM-R-A-53		Open F	
SM-R-A-52		Open F	
SM-R-A-51		Open F	
SM-R-A-50		Open F	
SM-R-A-49		Open F	
SM-R-A-48		Open F	
SM-R-A-47		Open F	
SM-R-A-46		Open F	
SM-R-A-45		Open F	
SM-R-A-44		Open F	
SM-R-A-43		Open F	
SM-R-A-42		Closed F	
SM-R-A-41		Open F	
SM-R-A-40		Open F	
SM-R-A-39		Open F	
SM-R-A-38		Open F	
SM-R-A-37		Open F	
SM-R-A-36	DEMO	Capture	609147 5369752
SM-R-A-35		Open F	
SM-R-A-34		Closed F	
SM-R-A-33		Open F	
SM-R-A-32		Open F	

After the Rain

F = Food

Reference 08/28/08
Transsect A cont.

6

Trap	Animal	Status	GPS
SM-R-A-31	DEMO	Capture	0609156 5369770
SM-R-A-30		Open F	
SM-R-A-29		Open F	
SM-R-A-28		Open F	
SM-R-A-27		Open F	
SM-R-A-26	DEMO	Capture	0609165 5369792
SM-R-A-25	DEMO JSU	Open F	
SM-R-A-24		Open F	
SM-R-A-23		Closed F	
SM-R-A-22		Open F	
SM-R-A-21		Open F	
SM-R-A-20		Open F	
SM-R-A-19		Open F	
SM-R-A-18		Open F	
SM-R-A-17		Open F	
SM-R-A-16		Open F	
SM-R-A-15		Open F	
SM-R-A-14		Open F	
SM-R-A-13		Open F	
SM-R-A-12		Open F	
SM-R-A-11		Open F	
SM-R-A-10		Open F	
SM-R-A-9		Open F	
SM-R-A-8		1/2 Open F	
SM-R-A-7		Open F	
SM-R-A-6		Closed F	
SM-R-A-5		Open F	
SM-R-A-4		Open F	
SM-R-A-3		Open F	
SM-R-A-2		Open F	
SM-R-A-1		Closed F	Knocked over

F = Fold

Not too bad. Seems quite random
where they are caught. not necessarily near
woody debris. As far as 30
Shermans from 43 on to 59 for A
else odd A Sherman

Reference 08/28/09
 Transsect C 09:40
 First set for transect

⑦

Trap	Animal	Status	GPS
SM-R-C-1		Open F	
SM-R-C-2		Open F	
SM-R-C-3		Open F	
SM-R-C-4		1/2 closed F	
SM-R-C-5		Open F	
SM-R-C-6		Open F	
SM-R-C-7		Open F	
SM-R-C-8		Open F	
SM-R-C-9		Open F	
SM-R-C-10		1/2 closed F	
SM-R-C-11		Open Must Fuel Gun!	
SM-R-C-12		8V Open Closed F	
SM-R-C-13		Open F	
SM-R-C-14	DEMO	Capture	0608684 5368050
SM-R-C-15		Open F	
SM-R-C-16		Open F	
SM-R-C-17		Open F	
SM-R-C-18		Closed F	
SM-R-C-19		Open F	
SM-R-C-20	DEMO	Capture	608679 5368032
SM-R-C-21	BTWR	Capture	608680 5369051
SM-R-C-22		Knocked all upside down	
SM-R-C-23		Open F	
SM-R-C-24		Closed F	
SM-R-C-25		Open F	
SM-R-C-26		Open F	

Drawing of end of all F = F..1

Rebecca 09/28/09
 Transact D 08:50
 First set for transect

⑧

Trap	Animal	Status	GPS
SM-R-D-1		Open F	
SM-R-D-2		Closed F	
SM-R-D-3		Open F	
SM-R-D-4	DEMO	Closed/Capture	609134 5369993
SM-R-D-5		Open F	
SM-R-D-6		Open F	
SM-R-D-7		Open no food	
SM-R-D-8		Closed F	
SM-R-D-9		Open F	
SM-R-D-10		Closed F	
SM-R-D-11		Open F	
SM-R-D-12		Open F	
SM-R-D-13		Open F	
SM-R-D-14		Open F	
SM-R-D-15		Open F	
SM-R-D-16		Open F	
SM-R-D-17		Open F	
SM-R-D-18	DEMO	Capture	609103 5369881
SM-R-D-19		Open F	
SM-R-D-20		Open F	
SM-R-D-21		Open F	
SM-R-D-22	DEMO	Capture	609108 5369892
SM-R-D-23		Open F	
SM-R-D-24		Open F	
SM-R-D-25		Open F	
SM-R-D-26		Open F	
SM-R-D-27		Open F	
SM-R-D-28		Closed F	
SM-R-D-29	DEMO	Capture	609120 5369920
SM-R-D-30		Closed F	
SM-R-D-31		Open F	
SM-R-D-32		Open F	

F = Food

Drawing at end of all.

Reference Area

Transsect C

08/28/09

15:30 out

Re set traps and add
six traps to lower line
now there are 32 traps

New end of second line, "North"

0608726 53680877
20

Probably cannot discern North
end of first line by GPS
EFE 24 ft

Reference Area

Transsect D

08/28/09

16:25 out

Re set traps and add
six traps to lower line
now there are 38 traps

New end of second line "North"
114. 0609143 UTM 5369958

Reference Area

Transsect A

08/28/09

17:43 out

Re set traps and add
six traps to end of line
now there are 65 traps

New end of line "South"

114. 0609097 UTM 5369620

Reference Trap set A
08/29/09
Therid Set on A
Warm this morning, Overcast
Animal Status GPS

Trap	Animal	Status	GPS
SM-R-A-65		Open F	
SM-R-A-64		Closed F	
SM-R-A-63		Open F	
SM-R-A-62	DEMO	Capture	97 Jan 36 609085 536961
SM-R-A-61		Open F	
SM-R-A-60		Closed F	
SM-R-A-59		Closed F	
SM-R-A-58		Open F	
SM-R-A-57	DEMO	Capture	609108 5369662
SM-R-A-56		Open F	
SM-R-A-55		Open F	
SM-R-A-54		Open F	
SM-R-A-53		Open F	
SM-R-A-52		Open F	
SM-R-A-51		Open F	
SM-R-A-50		Open F	
SM-R-A-49	DEMO	Capture	609120 5369640
SM-R-A-48	DEMO	Capture	609121 5369647
SM-R-A-47		Open F	
SM-R-A-46		Open F	
SM-R-A-45		Open F	
SM-R-A-44		Open F	
SM-R-A-43		Open F	
SM-R-A-42		Open F	
SM-R-A-41		Open F	
SM-R-A-40		Closed F	
SM-R-A-39		Open F	
SM-R-A-38		Closed F	
SM-R-A-37		Open F	
SM-R-A-36		Open F	
SM-R-A-35		Open F	
SM-R-A-34		Open F	
SM-R-A-33		Open F	
SM-R-A-32		Open F	
SM-R-A-31		Open F	
SM-R-A-30		Open F	

F = Food

Reference Transect A
09/29/09
Third S.A. on A

Out at 08:15

(11)

Trap	Animal	Status	GPS
SM-R-A-29		Open P	
SM-R-A-28		Closed F	
SM-R-A-27		Open F	
SM-R-A-26		Open F	
SM-R-A-25	YPCM	Capture	609166 5369791
SM-R-A-24		Closed F	
SM-R-A-23		Open Partial Food	
SM-R-A-22		Closed F	
SM-R-A-21		Open NF	
SM-R-A-20		1/2 Open F	
SM-R-A-19	DEMO	Capture	609179 5369823
SM-R-A-18		Closed F	
SM-R-A-17		Open F	
SM-R-A-16		Open F	
SM-R-A-15		Open F	
SM-R-A-14		Open F	
SM-R-A-13		Open F	
SM-R-A-12		Closed P	
SM-R-A-11		Open F	
SM-R-A-10		Open F	
SM-R-A-09		Open F	
SM-R-A-08		Closed F	
SM-R-A-07		Open F	
SM-R-A-06		Open F	
SM-R-A-05		Open F	
SM-R-A-04		Open F	
SM-R-A-03	DEMO	Capture	609209 5369885
SM-R-A-02		Open F	
SM-R-A-01		Open F	

F = Food

Generally west aspect on south
Face range/Mountain

Reference Transect
08/29/09
Second Set on D

(12)

Tray	Animal	Status	GPS
SM-R-D-38	YPCM	Open F	609138 5369954
SM-R-D-37		Open NF	
SM-R-D-36		Capture	
SM-R-D-35		Open F	
SM-R-D-34		Open F	
SM-R-D-33		Open F	
SM-R-D-32		Open F	
SM-R-D-31		Open F	
SM-R-D-30		Open F	
SM-R-D-29		Open F	
SM-R-D-28		Open F	
SM-R-D-27		Open F	
SM-R-D-26		Open F	
SM-R-D-25		Open F	
SM-R-D-24	YPCM	Open F	609108 5369893
SM-R-D-23		Capture	
SM-R-D-22		Closed F	
SM-R-D-21		Open NF	
SM-R-D-20		Open F	
SM-R-D-19		Open NF	
SM-R-D-18		Open F	
SM-R-D-17		Open F	
SM-R-D-16		Closed F	
SM-R-D-15		Open NF	
SM-R-D-14		Open F	
SM-R-D-13		Open F	
SM-R-D-12		Open F	
SM-R-D-11		Open F	
SM-R-D-10		Open F	
SM-R-D-09		Open F	
SM-R-D-08		Open F	
SM-R-D-07		Open F	
SM-R-D-06		Open F	
SM-R-D-05		Open F	
SM-R-D-04		Open F	
SM-R-D-03	DEMO	Capture F=F001	609129 5369938

Reference Transect
08/29/09
Second Set on D

out at 09:15

Trap	Animal	Status	GPS
SM-R-D-02		Open F	
SM-R-D-01		Open F	

Generally west aspect

Stn 0 vice versa / cloudy

Reference Transect
08/29/09
Second Set on C

Trap	Animal	Status	GPS
SM-R-C-32		Closed F	
SM-R-C-31		Open F	
SM-R-C-30		Open F	
SM-R-C-29		Open F	
SM-R-C-28		Closed F	
SM-R-C-27		Open F	
SM-R-C-26		Open F	
SM-R-C-25		Open F	
SM-R-C-24		Open F	
SM-R-C-23		Open F	
SM-R-C-22		Closed F	
SM-R-C-21	YPCM	Capture	608683 5368044
SM-R-C-20	DEMO	Capture	608677 5368035
SM-R-C-19		Open F	
SM-R-C-18		Closed F	
SM-R-C-17		Open F	
SM-R-C-16		Open F	
SM-R-C-15		Closed F	
SM-R-C-14		Open F	
SM-R-C-13		Open F	
SM-R-C-12		Open F	
SM-R-C-11		Open F	
SM-R-C-10	DEMO	Capture	608673 5368039

Final

(17)

Reference Transect
 08/29/09
 Second Set on C, Out at 10:

Trap	Animal	Status	GPS
SM-R-C-9		Open F	
SM-R-C-8		Open F	
SM-R-C-7		Open F	
SM-R-C-6		Closed F	
SM-R-C-5		Open F	
SM-R-C-4		Closed F	
SM-R-C-3	DEMO	Capture	608 707 5369063
SM-R-C-2		Closed F	
SM-R-C-1		Open F	

F = Food

Transect C is a more mature
 pine / fir forest understory not
 dense

OU-3 Transect A
 08/29/09 Set 14:56

MOU 301

11 M 618 985 536 7283
 "West" End of Transect

11 M 614 121 536 7217
 "East" End of Transect
 Odd Even Sherman / Hawk heard
 until 20 30 gu, then all Sherman
 35 traps set

Overcast, no rain

Generally, South aspect.

08/29/09 Transect B out 16:00
 M0U302
 11 U 618587 5367594
 "West" End

11 U 618550 5367516
 "East" End to trap 25
 Some rain while on Transect B

11 U 618581 5367592
 "West End" at South side
 to trap 37

Jeff with us in the AM

08/29/09 out 17:42
 Reference Area
 Transect A
 Set 59 traps less the
 traps which caught in AM.
 There is no replacement
 Relatively, Cool today

08/30/09
 Reference Area Transect A
 Fourth Set on Transect

Trap	Animal	Status	GPS
SM-R-A-65	SM-R-A-65	Open F	
SM-R-A-64		Open F	
SM-R-A-63		Open F	
SM-R-A-62		No Trap	
SM-R-A-61		Open F	
SM-R-A-60		Open F	
SM-R-A-59		Open F	
SM-R-A-58		Open F	
SM-R-A-57		No Trap	
SM-R-A-56		Captured	

DEM O
 609114 5369675
 80V

Reference Transact A
68130109
Fourth Set

Trap	Animal	Status	GPS
SM-R-A-55	DEMO	Capture	609111 5369671
SM-R-A-54		Open NF	
SM-R-A-53	YPCM	Capture	609112 5369679
SM-R-A-52		Open F	
SM-R-A-51	✓	Open F	
SM-R-A-50	YPCM	Capture	609118 5369689
SM-R-A-49		No. Tray	
SM-R-A-48		No. Tray	
SM-R-A-47		Open F	
SM-R-A-46		Open F	
SM-R-A-45		Open F	
SM-R-A-44		Open F	
SM-R-A-43		Open F	
SM-R-A-42		Open F	
SM-R-A-41		Open F	
SM-R-A-40		Open F	
SM-R-A-39		Open F	
SM-R-A-38		Open F	
SM-R-A-37		Open F	
SM-R-A-36		Open F	
SM-R-A-35		Open F	
SM-R-A-34		Open F	
SM-R-A-33		Open F	
SM-R-A-32		Closed F	
SM-R-A-31		Open F	
SM-R-A-30	YPCM	Capture	609161 5369767
SM-R-A-29	YPCM	Capture	609159 5369774
SM-R-A-28		Open F	
SM-R-A-27		Open F	
SM-R-A-26	DEMO	Capture	609160 5369789
SM-R-A-25	DEMO	Capture	609168 5369790
SM-R-A-24		Closed F	
SM-R-A-23		Open NF	
SM-R-A-22		Closed F	
SM-R-A-21		Open F	
SM-R-A-20		Closed F	

F = Food

Reference Transect A
08/30/09 Out 6:30
Fourth Set

Trap	Animal	Status	GPS
SM-R-A-19		No Trap	
SM-R-A-18	DEMO	Capture	609170 5369817
SM-R-A-17		Open F	
SM-R-A-16		Closed F	
SM-R-A-15		Open F	
SM-R-A-14		Closed F	
SM-R-A-13		Open F	
SM-R-A-12		Open F	
SM-R-A-11		Open F	
SM-R-A-10		Open F	
SM-R-A-09	DEMO	Capture	609177 5369858
SM-R-A-08		Open F	
SM-R-A-07		Open F	
SM-R-A-06		Open F	
SM-R-A-05		Open F	
SM-R-A-04		Open F	
SM-R-A-03		No Trap	
SM-R-A-02		Open F	
SM-R-A-01		Open F	

F = Food

OU-3 Tray set A, MON 301

08/30/09

First set

Out at 10:15

Drawing at end

Animal

at AM

Start us

GBS

Tray

SM-S-A-01

SM-S-A-02

SM-S-A-03

SM-S-A-04

DEMO

SM-S-A-05

DEMO

SM-S-A-06

DEMO

SM-S-A-07

SM-S-A-08

SM-S-A-09

SM-S-A-10

SM-S-A-11

DEMO

SM-S-A-12

DEMO

SM-S-A-13

SM-S-A-14

closed

SM-S-A-15

SM-S-A-16

SM-S-A-17

SM-S-A-18

SM-S-A-19

SM-S-A-20

SM-S-A-21

DEMO

SM-S-A-22

SM-S-A-23

SM-S-A-24

SM-S-A-25

SM-S-A-26

SM-S-A-27

SM-S-A-28

SM-S-A-29

DEMO

SM-S-A-30

SM-S-A-31

SM-S-A-32

SM-S-A-33

SM-S-A-34

SM-S-A-35

Open P

Closed F

Open P

Capture

619001

5367296

Capture

619001

5367294

Capture

619006

5367288

Open P

Closed F

Open F

Closed F

Capture

619027

5367279

Capture

619032

5367278

Open F

Open F

Open F

Open F

Open F

Open F

Open F

Open F

Open F

Capture

619065

5387254

Open F

Open F

Open F

Open F

Open F

Open F

Capture

619094

5367230

Open F

Open F

Open F

Open F

Open F

Open F

F = Foul

OU-3, Transact B, MON 302

08/30/09 10:46

Clear not to hit

Drawing at end of all.

19

Trap	Animal	Status	GPS
SM-S-B-01	DEMO	Capture	618592 5367801
SM-S-B-02		Open F	
SM-S-B-03		Open F	
SM-S-B-04		Closed F	
SM-S-B-05		Closed F	
SM-S-B-06	DEMO	Capture	618590 5367579
SM-S-B-07		Open F	
SM-S-B-08		Closed F	
SM-S-B-09		Open F	
SM-S-B-10		Open F	
SM-S-B-11		Closed F	
SM-S-B-12		Open F	
SM-S-B-13		Open F	
SM-S-B-14		Open F	
SM-S-B-15		Open F	
SM-S-B-16		Open F	
SM-S-B-17		Closed F	stroke hit it, Ranger
SM-S-B-18		Open F	
SM-S-B-19		Open F	
SM-S-B-20		Open F	
SM-S-B-21		Open F	
SM-S-B-22		Open F	
SM-S-B-23		Open F	
SM-S-B-24		Closed F	
SM-S-B-25		Open F	
SM-S-B-26		Turned over	
SM-S-B-27		Turned over	
SM-S-B-28	DEMO	Capture	618575 5387564
SM-S-B-29		Open F	
SM-S-B-30		Open F	
SM-S-B-31		Open F	
SM-S-B-32		Open F	
SM-S-B-33	DEMO	Capture	618581 5367581
SM-S-B-34		Closed F	
SM-S-B-35	DEMO	Capture	618582 5367581
		F = Fov	

OU-3 Transsect B, Mon 302
08/30/09 10:40 out

(20)

Trap	Animal	Status	GPS
SM-S-B-386	juv	Open F	
SM-S-B-397	juv	Open K	
SM-S-B-35	juv	F = Cool	

Set trap lines. it is hot

OU-3 Transsect D, Near SL 1502
08/30/09 12:00 traps out

"S West" End
617 032 536 7811

"North East" End
617 660 536 7582

OU-3 Transsect E, Near SL 4503
08/30/09 Out 15:35
21 traps

"North End" End
618 623 536 7864

"South West" End
618 512 536 7002

OU-3 Transsect A, Near Mon 301
Second Set Out 16:40
35 trap

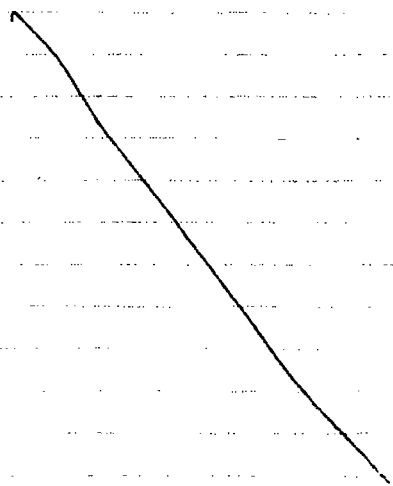
Note on AFS DS
http://ftp.syrres.com/
Libby OU3
ig J #6 f b g

OU-3 Transsect D
08/31/09 Done 08:15

Trap	Animal	Status	GPS
SM-S-D-1	DEMO	Capture	617633 5367615
SM-S-D-2		Closed F	
SM-S-D-3		Open F	
SM-S-D-4	DEMO	Capture	617640 5367624
SM-S-D-5		Open F	
SM-S-D-6		1/2 Closed F	
SM-S-D-7	DEMO	Capture	617653 5367630
SM-S-D-8		1/2 closed	
SM-S-D-9		Open F	
SM-S-D-10	DEMO	Capture	617659 5367624
SM-S-D-11	DEMO	Capture	617670 5367627
SM-S-D-12		Closed F	
SM-S-D-13		Open F	
SM-S-D-14		Closed F	
SM-S-D-15		Open F	Shur
SM-S-D-16		Open F	Shur
SM-S-D-17		Open F	
SM-S-D-18	DEMO	Capture	617663 5367588
SM-S-D-19	DEMO	Capture	617664 5367589
SM-S-D-20		Open D	
SM-S-D			

F = Food

Drawing at end of all



Trap	Animal	Status	GPS	
SM-S-A-1		Open F		
SM-S-A-2	DEMO	Capture	618990	5367280
SM-S-A-3	DEMO	Capture	618993	5367280
SM-S-A-4	WJMO	Capture	619003	5367287
SM-S-A-5	DEMO	Capture	619005	5367288
SM-S-A-6		Closed F		
SM-S-A-7		Open F		
SM-S-A-8		Open F Closed F		
SM-S-A-9		Open F		
SM-S-A-10		Open F		
SM-S-A-11		Open F		
SM-S-A-12		Open F		
SM-S-A-13		Open F		
SM-S-A-14		Open F		
SM-S-A-15		Open F		
SM-S-A-16		Open F		
SM-S-A-17	WJCM	Capture	619055	5367263
SM-S-A-18		Closed F		
SM-S-A-19		Open F		
SM-S-A-20		Open F		
SM-S-A-21		Open F		
SM-S-A-22		Closed F		
SM-S-A-23		Open F		
SM-S-A-24		Open F		
SM-S-A-25		Open F		
SM-S-A-26		1/2 Closed		
SM-S-A-27		Open F		
SM-S-A-28		Open F		
SM-S-A-29		Open F		
SM-S-A-30		Closed F		
SM-S-A-31		Open F		
SM-S-A-32		Open F		
SM-S-A-33		Open F		
SM-S-A-34		Open F		
SM-S-A-35		Open F		

F = Food

OU 3 ↑ answer 7 C
00/31/04 09:55

(23)

Trap	Animal	Status	GPS	
SM-S-C-1A		Open F		
SM-S-C-1B		Closed F		
SM-S-C-1C		Open F		
SM-S-C-2		Open F		
SM-S-C-3		Open F		
SM-S-C-4		Open F		
SM-S-C-5		Open F		
SM-S-C-6		1/2 closed		
SM-S-C-7	DEMO	Capture	618586	5367873
SM-S-C-8		Closed F		
SM-S-C-9	DEMO	Capture	618581	5367880
SM-S-C-10		Closed F		
SM-S-C-11	DEMO	Capture	618575	5367881
SM-S-C-12		Open F		
SM-S-C-13	BTWR	Capture	618568	5367886
SM-S-C-14		Open F		
SM-S-C-15		Open F		
SM-S-C-16	DEMO	Capture	618557	5367899
SM-S-C-17	DEMO	Capture	618550	5367891
SM-S-C-18		Open F		
SM-S-C-19		Open F		

F = Food

SM-S-C-17 lost Animal as it jumped out when checking

Drawing A and at A11

(24)

OU 3, Transsect F, Near SL 9503
Set, 2 cups out 16:35

"East End"
619 523 536 6695

"West End"
619 495 538 6972
492 776 GPS having trouble

Reset
OU 3, Transsect A,
Third time out 17:00

OU 3, Transsect F, Near SL 9502
Out at 18:20
~~"NW" end~~ "Southeast" End
619 395 538 7189
now GPS For North end or "Northeast" end
N end

Hot today but not as hot
as Sunday 09/30/09

OU3, Transect F
09/01/09 out

8:18

(25)

Trap	Animal	Status	618391	536798
SM-S-F-01	DEMO	Capture	608571	5360881
SM-S-F-02	DEMO	Capture	618395	5367200
SM-S-F-03		Open F		
SM-S-F-04		Closed F		
SM-S-F-05		Open F		
SM-S-F-06		Open F		
SM-S-F-07		Open F		
SM-S-F-08		Open P		
SM-S-F-09		Open P		
SM-S-F-10		Open F		
SM-S-F-11		Open F		
SM-S-F-12		Open F		
SM-S-F-13		Open P		
SM-S-F-14		Closed F		
SM-S-F-15		Open P		
SM-S-F-16		Closed F		
SM-S-F-17		Open F		
SM-S-F-18		Open F		
SM-S-F-19		Open P		

SM-S 80

F = Food

"North East" End
618408 5367230

"South West" End
618388 5367195

Drawings at end of All

OW-3 Transsect A
09/01/09 out 9:15

(28)

Trap	Animal	Status	GPS
SM-S-A-01		Open F	
SM-S-A-02		No trap	
SM-S-A-03		No trap	
SM-S-A-04	DEMO	No trap Capture	619000 5367288
SM-S-A-05		No trap	
SM-S-A-06	Grasshopper	Wrong Cotel	
SM-S-A-07		Open F	
SM-S-A-08	WPCM	Capture	619010 5367276
SM-S-A-09	DEMO	Capture	619016 5367288
SM-S-A-10		Closed F	
SM-S-A-11		Open F	
SM-S-A-12		Open F	
SM-S-A-13		Open F	
SM-S-A-14	WPCM	Capture	619039 5367277
SM-S-A-15		Open F	
SM-S-A-16		Closed F	
SM-S-A-17	DEMO	Capture	619054 5367268
SM-S-A-18		Closed F	
SM-S-A-19	DEMO	Capture	619060 5367257
SM-S-A-20		Closed F	
SM-S-A-21		Open F	
SM-S-A-22		Open F	
SM-S-A-23		Open F	
SM-S-A-24		Open F	
SM-S-A-25	YPCM	Capture	619086 5367239
SM-S-A-26		1/2 Closed	
SM-S-A-27		Open F	
SM-S-A-28		Closed F	
SM-S-A-29		Open F	
SM-S-A-30		Closed F	
SM-S-A-31	DEMO	Capture	619107 5367230
SM-S-A-32	YPCM	Capture	619112 5367228
SM-S-A-33	YPCM	Capture	61911 5367228
SM-S-A-34	YPCM	Capture	619117 5367224
SM-S-A-35		Open NF	

F = Food NF = No Food

04-3 Transsect E near SL 78
09/01/09 Out 09:30 (27)

Trap	Animal	Status	GPS
SM-S-E-01		Open F	
SM-S-E-02		Closed F	
SM-S-E-03		Open F	
SM-S-E-04		Open F	
SM-S-E-05		Closed F	
SM-S-E-06		Open F	
SM-S-E-07	YPCM	Captured	619514 5366725
SM-S-E-08		Open F	
SM-S-E-09		Open F	
SM-S-E-10		Open F	
SM-S-E-11		Open F	
SM-S-E-12		Closed F	
SM-S-E-13		Open F	
SM-S-E-14		Open F	
SM-S-E-15		Open F	
SM-S-E-16		Open F	
SM-S-E-17		Open F	
SM-S-E-18		Open F	
SM-S-E-19		Open F	
SM-S-E-20		Open F	

Drawing at end of all
F = End

04-3 Transsect E
09/01/09 Out 16:40

New East is 619521 536690 #35 trap set
Not as Holes 35 traps set

04-3 Transsect F New Angle
09/01/09 Out 17:35

East End 618382 5367209
West End 618327 5367244
Need to check in A.M. trap set

09/02/09
 OU-3, Transsect K
 2 try, new transect

(28)

Trap	Animal	Status	GPS
SM-S-F-1		Open F	
SM-S-F-2		1/2 Closed	
SM-S-F-3	DEMO	Capt. Fall	618379 5367212
SM-S-F-4		Closed F	
SM-S-F-5		Open F	
SM-S-F-6		Closed F	
SM-S-F-7	YPCM	Capture	618363 5367214
SM-S-F-8		Closed F	
SM-S-F-9		Open F	
SM-S-F-10		Open F	
SM-S-F-11		Open F	
SM-S-F-12		Closed F	
SM-S-F-13		Open F	
SM-S-F-14		Closed F	
SM-S-F-15	DEMO	Capture	618364 618 5367226
SM-S-F-16	DEMO	Capture	618354 5367227
SM-S-F-17		Open F	
SM-S-F-18		Open F	
SM-S-F-19		Open F	
SM-S-F-20		Open F	
SM-S-F-21		Open F	
SM-S-F-22		Open F	
SM-S-F-23		Open F	
SM-S-F-24		Open F	
SM-S-F-25		Open F	
SM-S-F-26		Open F	
SM-S-F-27		Open F	
SM-S-F-28		Open F	
SM-S-F-29		Open F	
SM-S-F-30		Open F	
SM-S-F-31		Open F	
SM-S-F-32		Open F	

F = Food

Dew trap, OK 3 or line

09/02/09
 OU-3, Transsect E
 Second Set Out 09:10

(2)

Tray	Animal	Status	GPS
SM-S-E-1		Open F	
SM-S-E-2		Open F	
SM-S-E-3		Open P	
SM-S-E-4		Closed F	
SM-S-E-5		Open F	
SM-S-E-6		Closed	
SM-S-E-7		Open P	
SM-S-E-8		1/2 Closed	
SM-S-E-9		Open F	
SM-S-E-10		Open F	
SM-S-E-11		Open F	
SM-S-E-12	DEMO	Capture	619520 5366734
SM-S-E-13	YPCM	Capture	619516 5366738
SM-S-E-14		Open F	
SM-S-E-15		Open F	
SM-S-E-16		Open F 1/2	
SM-S-E-17		Open F	
SM-S-E-18	DEMO	Capture	619504 5366761
SM-S-E-19		Open F	
SM-S-E-20		Open F	
SM-S-E-21		Open F	
SM-S-E-22		Open F	
SM-S-E-23		Open F	
SM-S-E-24		Open F	
SM-S-E-25		Open F	
SM-S-E-26		Open F	
SM-S-E-27		Open F	
SM-S-E-28		Open F	
SM-S-E-29		Open F	
SM-S-E-30		Open P	
SM-S-E-31		Open F	

F = Food

Wet with Dew
 "East" 619525 5366699
 "West" 619516 5366762
 493

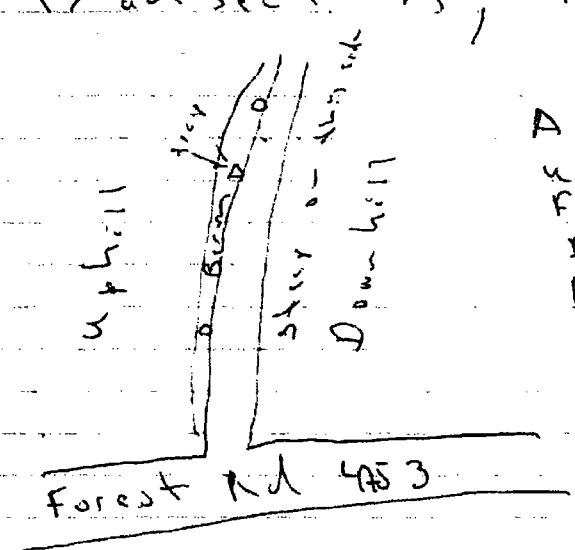
Transsect F 043
09/02/09

Trap	Animal	Status	GPS
SM-S-E-32		Open F	
SM-S-E-33		Open F	
SM-S-E-34		Open E	
SM-S-E-35		Open F	

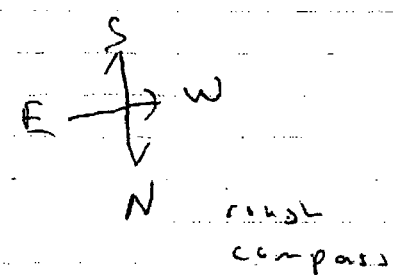
F = E.1

Fig. 1111 All draws on 09/02/09
For Transsect

Transsect A, Ref



All draws set on
up hill side of unnamed
Forest Service Rd off
FR 4753
Berm height varied from
6-15 feet. Some traps
set around alders or
aspens

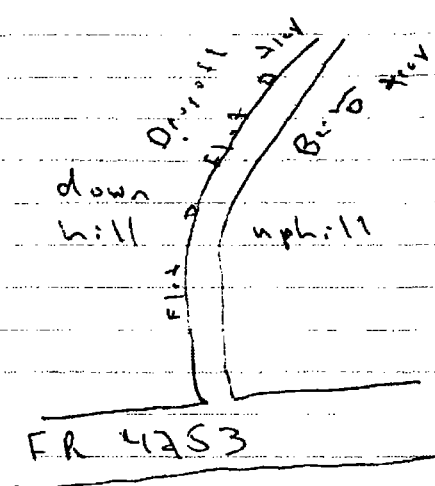


not to scale

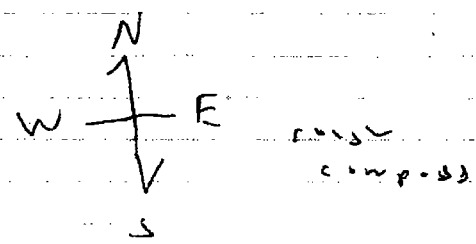
09/02/09

Transsect B

Reference
JUV



Traps set on both sides of this unnamed Forest Rd. This road was just East of the road that Transsect A was on

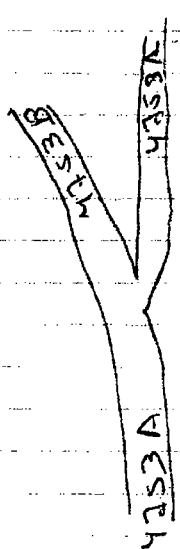


09/02/09

Transsect C

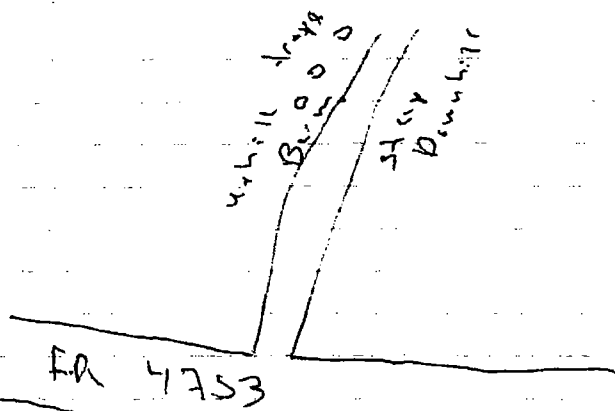
Ref

is off of Forest Rd 4753A



Transsect in Forest off of Road. Traps were set in two roughly parallel lines. The two lines were at least 30 ft apart. Both lines were a part of Transsect C. This was the only transsect in a mature pine forest

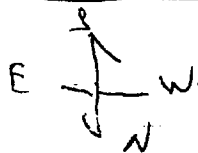
not to scale



09/02/09
Transsect
B

(35)

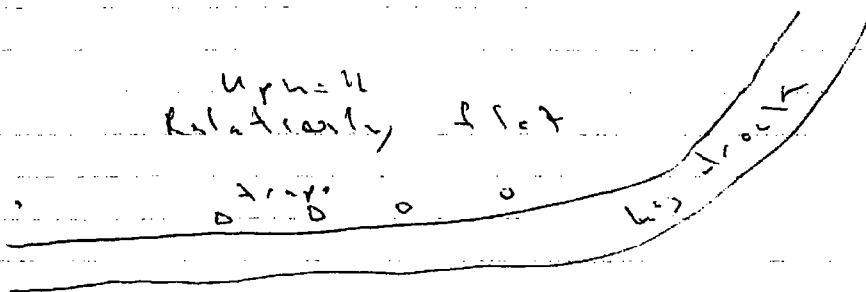
All drops set on
uphill side of road
most at top of Berm
This was a mistake
that had been cut
but a lot of
seed trees left
behind.



rough compass

Transsect A, OU 3

09/02/09



Downhill

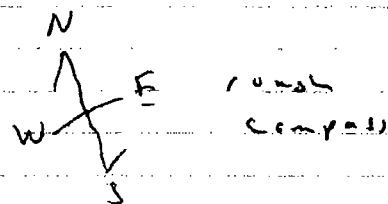
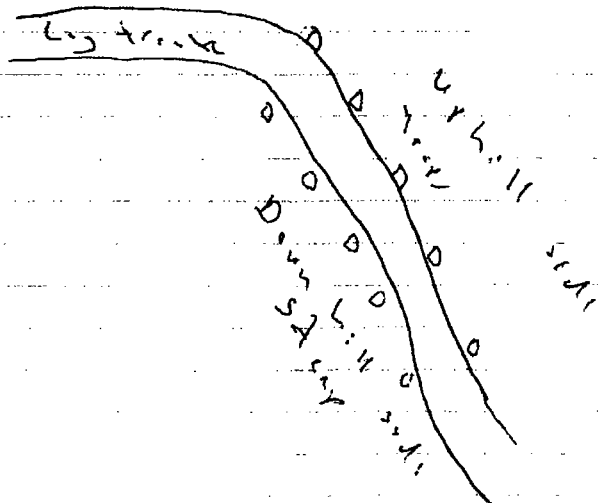
Area had been cut with seed
trees left behind. All drops
set on uphill side of road.
Good shrub growth in the area.

not to any scale

09/02/09

(33)

Transsect B, OUB
not to any scale



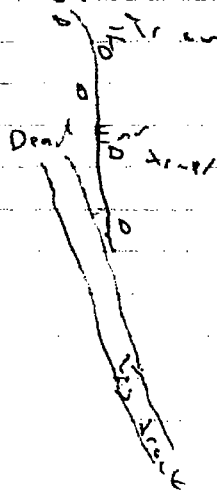
Traps were set on both sides of road. did include the curve. There was a high (15-20 ft. tall) burn on the uphill side.

Traps were set at the top and bottom of the burn on the uphill side. Traps were mainly near the road on the downhill side.

SL-4503

09/02/09

Transsect C in OUB



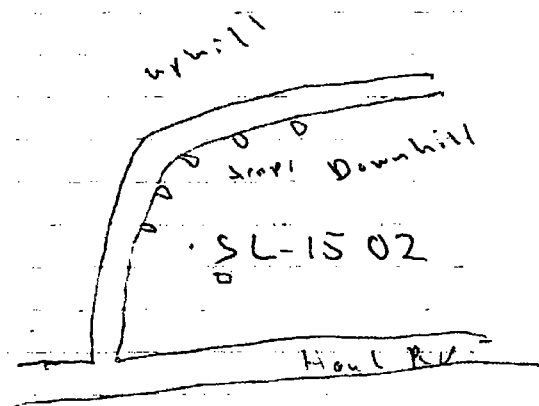
Transsect went off at the end of the log road into the forest. This transsect is near SL 4503. The transsect went downward, the soil sample sets. Traps were set on both sides of the transsect. Forest had been cut but there was a lot of new growth.

not to any scale

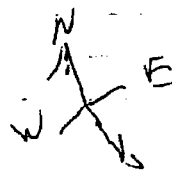
09/02/09

(34)

Tr on sec 4 D, in 043



All traps were set on downhill side of road. There were some more mature trees at this site. Some old

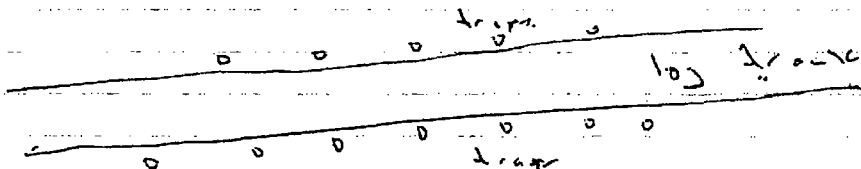
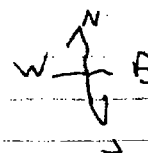


rough compass

not to scale

Tr on sec 1 E, 043, near SL-7503

SL 75

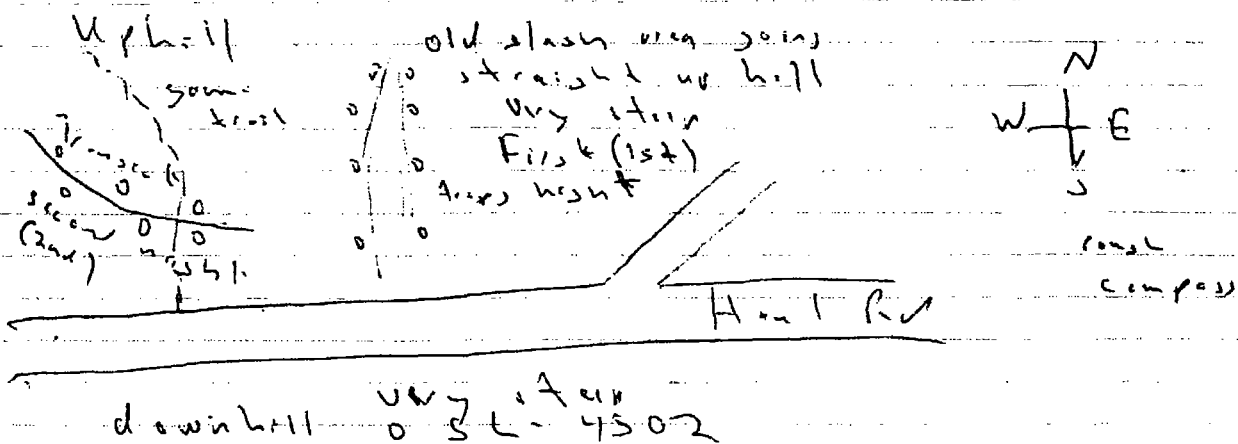


rough compass

Area had been logged with seed trees left behind, relatively dense shrubs. The first trap nest & trap were only set on downhill side of road. On second nest & trap were set on both sides of road.
not to scale

35

Transect F, 043, near SL-4502



The first night traps were set on both sides of an old slash area that was straight up the hill. The second night a new transect was set along a more access the slope. This area has been cutting the pad on the uphill side. However, there were some more mature trees. This was the steepest place to try to set a trap line.

End

not to scale

APPENDIX E
NECROPSY LOGBOOKS



COMPOSITION BOOK

Libby

Aug - Sept 2009

Mouse Necropsy Log

Anne Fairbrother

Item No. 63797

Wide Rule • 80 Sheets • 10" x 7 7/8"

A. Fairbrother
Libby Small Mammal Project
August 2009 - Sept. 2009

August 27, 2009

- SM-R-A-40-1

Photos 4-5-6

· External exam - unremarkable

· Length - $6\frac{1}{4}$ "

· Internal exam - unremarkable

(lungs put into cassettes & then removed)

- SM-R-A-26-1

Photos - 7-8-9

· External exam - unremarkable

· Length - $5\frac{3}{4}$ "

· Internal exam - unremarkable

(lungs put into cassettes + then removed)

- SM-R-A-27-1

Photos 13-14-15

· External exam - unremarkable

· Length $6\frac{1}{4}$ "

· Internal exam - unremarkable

- SM-R-A-5-1

Photos 19-20-21

· External exam - unremarkable

· Length 6"

· Internal exam - unremarkable

difficult to perfuse lung due to small size of the trachea. Left lung lobes separated.

August 28, 2009

• SM-R-A-36-1

Photos 25-26-27

• External exam: unremarkable

• Length 7"

• Internal exam - blue stomach very full of macerated blue-black material (berries?)

• Separated trachea from lungs - put both into formalin

• SM-R-A-26-2

Photos - 31-32-33

• External exam: unremarkable

• Length: 5 3/4"

• Internal exam: unremarkable

• SM-R-A-31-1

• External exam unremarkable Photos: 34-35-36

• Length 7"

• Internal exam unremarkable

• SM-R-D-18-1

Photos: ^{EE AF} 40-41-42-43

• External exam - unremarkable

• Length 6 1/8"

• Internal exam - unremarkable

SM-R-D-4-1

Photos 44-45-46

external exam - unremarkable

length: $5\frac{3}{4}$ "

internal exam - unremarkable

SM-R-C-14-1

Photos 50-51-52

external exam: unremarkable

length: $6\frac{3}{4}$ "

internal exam: unremarkable

Rt adrenal cut into 2 pieces - both put in cassette

SM-R-D-29-1

Photos 56-57-58

external exam: unremarkable

length: $6\frac{3}{4}$ "

internal exam: unremarkable

Rt eye removed from external sac; both eye + sac put into formalin. Eyeball still intact.

August 29, 2009

SM-R-A-57-2

Photos 60-61-63

external exam: unremarkable

length: $6\frac{3}{4}$ "

Internal exam - penis enlarged with a blood clot (hematoma) just under the bladder

- SM-R-A-3-1 Photos 65-66-67
 - External exam: unremarkable
 - Length: $5\frac{7}{8}$ "
 - Internal exam: unremarkable

- SM-R-A-19-1 Photos: 70-71-73
 - External exam: unremarkable
 - Length: $5\frac{7}{8}$ "
 - Internal exam: unremarkable

- SM-R-A-48-1 Photos: 74-75-76
 - External exam: unremarkable
 - Length: 7"
 - Internal exam: unremarkable

- SM-R-C-20-2 Photos 80-81-82
 - External exam: unremarkable
 - Length 6"
 - Internal exam: unremarkable

- SM-R-C-10-1 Photos 83-84-85
 - External exam: unremarkable
 - Length: $6\frac{7}{8}$ "
 - Internal exam: unremarkable

August 30, 2009

• SM-R-A-9-1

Photos 91-92-94

• External exam: unremarkable

• Length: $5\frac{3}{4}$ "

• Internal exam: unremarkable

Lost trachea (& thyroids) during dissection
So NOT collected.

• SM-R-A-26-3

Photos 95-96-97

• External exam unremarkable

• Length: 7"

• Internal exams unremarkable

• SM-R-A-18-1

Photos 101-102-103

• External exam - unremarkable

• Internal exam: Adrenal ed; both small

• Length: $6\frac{3}{4}$ "

• SM-S-A-29-1

Photos 106-107-109

• External exam - unremarkable

• Length: 6"

• Internal exam: - unremarkable

• SM-S-A-12-1

Photos: 111-112-113

• External exam: unremarkable

• Length: $6\frac{1}{4}$ "

• Internal exam: unremarkable

• SM-S-A-14-1

Photos: 117-118-119

• External exam: unremarkable

• Length: $6\frac{3}{8}$ "

• Internal exam: unremarkable

• SM-S-A-11-1

Photos: 121-122-123-124

• External exam: Appears to have bot larva in groin

• Length: $6\frac{1}{2}$ "

• Internal exam: live, mature bot larva in inguinal area. Weighs 1.0 gm. Removed & saved in formalin. Spleen appears larger than normal. Photographed bot in situ.

• SM-S-B-35-1

Photos 129-130-132

• External exam: unremarkable

• Length: $5\frac{3}{4}$ "

• Internal exam: unremarkable

Rt adrenal cut in $\frac{1}{2}$ - both pieces put into cassette.

- SM-S-B-1-1

Photos: 135-136-138

- External exam: unremarkable

- Length: 6"

- Internal exam: unremarkable

- SM-S-B-6-1

Photos: 141-142-144

- External exam: unremarkable

- Length: 5 7/8"

- Internal exam: unremarkable

-124
August 31, 2009

- SM-S-D-7-1

Photos 147-148-150

- External exam: unremarkable

- Length: 6"

- Internal exam: unremarkable

- SM-S-D-4-1

Photos 151-152-153

- External exam: unremarkable

- Length: 5 1/4"

- Internal exam: unremarkable

- SM-S-D-11-1

Photos: 158-159-160

External exam: Unremarkable

length: $6\frac{1}{4}$ "

Internal exam:

Photo 161 - liver in situ

One lobe of liver white &

162 - liver, ventral

fibrotic in appearance.

163 - liver, dorsal

Collected sections in a cassette/formalin.

Remainder of internal exam unremarkable

- SM-S-D-10-1

Photos 167-168-169^{AP}

External exam: unremarkable

length: $5\frac{3}{4}$ "

Internal exam unremarkable

- SM-S-A-2-1

Photos 172-173-175

External exam: unremarkable

length: $6\frac{1}{4}$ "

Internal exam: unremarkable

- SM-S-A-5-2

Photos 176-177-178

External exam: unremarkable

Length: $6\frac{3}{4}$ "

Internal exam: unremarkable

SM-S-C-16-1

arm bot
Photos: 183-184-185-186

- External exam: Bot in groin 0.8 gms mature
- length: 6" " " upper Rt shoulder 0.1 g immature
lower triceps
- Internal exam - unremarkable

SM-S-C-11-1

Photos ~~167-168~~ 167-168 AF
188-189-190

- External exam: unremarkable
- length: $5\frac{3}{4}$ "
- Internal exam -

Photo 192 - Liver

Small white lesion on one liver lobe
Put in tissue cassette - formalin

September 01, 2009

SM-S-F-2-1

Photos: 197-198-200

- external exam: unremarkable
- length: $6\frac{1}{2}$ "

Internal exam: Photo 201-202 = Liver
Liver surface somewhat rough white spots in
several lobes. Photographed & saved pieces
in cassette / formalin.

SM-S-A-19-1

Photos: 204-205-206

- external exam: unremarkable. Old empty bot sac
in groin
- length: ~~7 3/8~~ AF 7 3/8"
- Internal exam: lots of food in stomach

• SM-S-A-17-1

Photos: 210-211-213

• External exam - mature but larvae in grain @ 1.0g

• Length: $6\frac{3}{8}$ "

• Internal exam: Spleen appears enlarged.

Trachea torn in lungs during dissection - put into formalin as a separate tissue. Lungs NOT infused.

• SM-S-A-4-2

Photos: 215-216-217

• External exam: unremarkable

• Length: $6\frac{1}{8}$ "

• Internal exam: unremarkable

• SM-S-A-9-1

Photos: 218-219-220

• External exam: Small but larvae @ grain 0.2g

• Length: $6\frac{3}{8}$ "

• Internal exam: unremarkable

September 02, 2009

• SM-S-F-3-1

Photos 229-230-231

• External exam: unremarkable

• Length: $6\frac{1}{4}$ "

• Internal exam: photos: 232-233-234 = LIVER

Liver Rough Surface & lots of white spots,
collected into formalin/cassette

SM-S-F-15-1

Photos: 235-236-237

External exam unremarkable

Length: $6\frac{1}{4}$ "

Internal exam

LIVER
Photos: 238-239-240

Liver normal color & glossy, but has several white nodules. Photographed & saved pieces in formalin/cassette

SM-S-F-16-1

Photos: 241-242-243

External exam: bot ^{sac} in (L) groin - abraded & pup-filled

Length: $5\frac{7}{8}$ "

No bot present

Internal exam unremarkable

SM-S-E-18-1

Photos: 244-245-246-247 ^{tail}

External exam: tail has old break in middle

Length: $6\frac{7}{8}$ "

Internal exam:

Photos: 249-250-251 = LIVER

Liver white material found throughout - very extensively involved. Photographed and saved in formalin/cassettes

Several mesenteric lymph nodes appear enlarged

SM-S

Photos: 252-253-254

External exam: Sm bot sac in (L) groin - empty

Length: $6\frac{3}{8}$ "

Internal exam:

Photos: 255-256-257-258 Liver

Liver with white spots. friable. Saved in formalin/cassette



COMPOSITION BOOK

Parametrix

Necropsy logbook

Remediation Project (sm. mammal)

Sue Robinson

Item No. 63797

Wide Rule • 80 Sheets • 10" x 7 7/8"

S. Robinson

Libby Small Mammal Project

8/20/09

Scale calibration completed 200.2 g

1. SM-R-A-32-1 (Peromyscus) Frames 001 dorsal
Length 6" Female 002 ventral
003 internal

external: unremarkable

internal unremarkable

Note ^{trachea + esophagus} Lung stuck on paper towel!

2. SM-R-A-11-1 (Peromyscus) Frames 0010 dorsal
Length 6 1/2" 0011 ventral
Female 0012 inside/internal
unremarkable internal, external

3. SM-R-A-29-1 (Peromyscus) Frames 0016 dorsal
Length 6 3/4" 0017 ventral
Male 0018 inside/internal
Bot fly larvae

unremarkable external, internal except
bot larvae

8-27-2009

4. SM-R-B-15-1 (peromyscus)

6 1/2 " long

Female

Frames

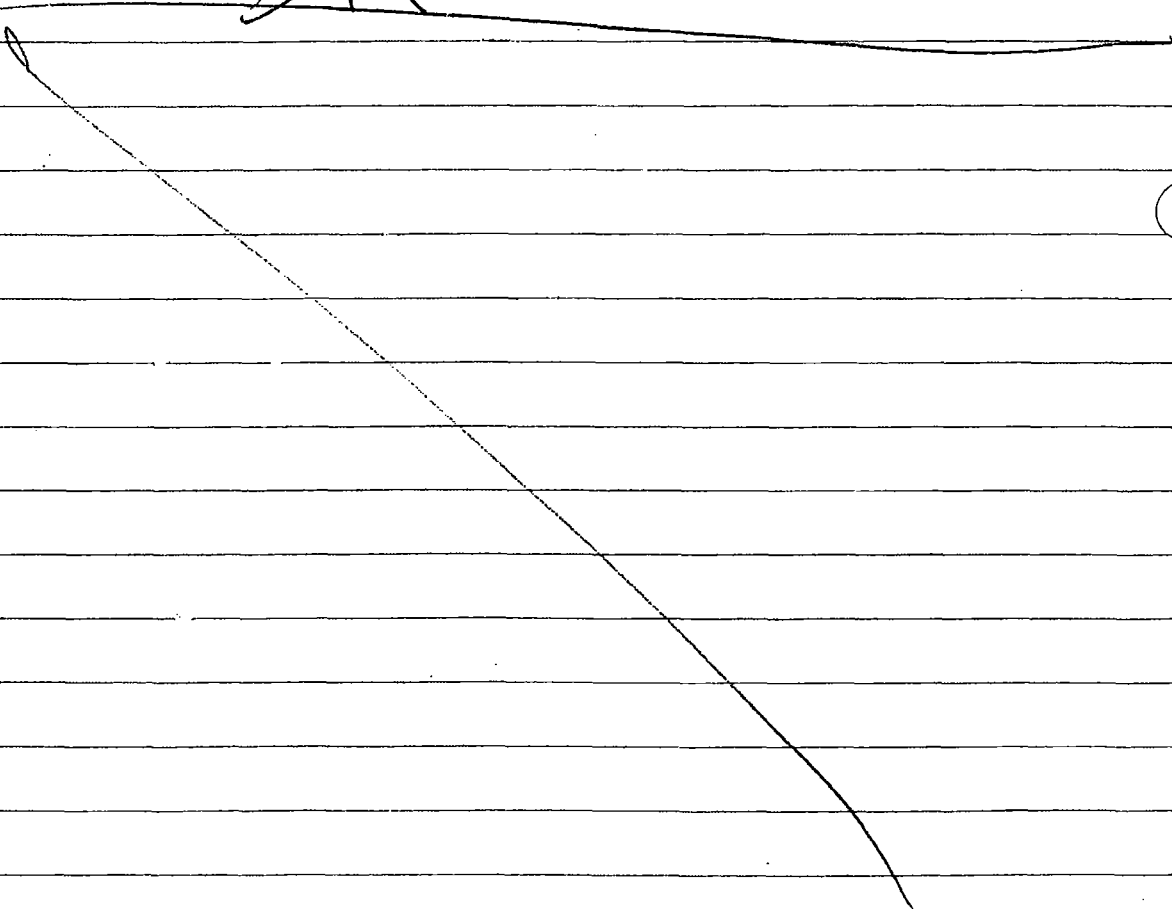
0022 Dorsal

0023 Ventral

0024 inside

unremarkable interior, exterior

See



8-28-2009

1. SM-R-A-56-1 (Peromyscus)

Female

Frames

dorsal

ventral

inside

0028

0029

0030

7" length

unremarkable internal, external
very full stomach

2. SM-R-A-57-1 (Peromyscus)

Frames

7 inches

0037

dorsal

Length = ~~8 inches~~

0038

ventral

0039

internal

Female

0040

lesion

unremarkable interior, exterior, EXCEPT:

possible bot fly

Possible bot fly lesion; saved, photographed.

Sending to Northwest Zoopath for histology.

3.

3. SM-R-C-20-1 (Peromyscus)

Frames

Length = ~~7 1/2 inches~~
6 1/2 inches

0047

dorsal

0048

ventral

Male

0049

inside

unremarkable
internal and external

4. SM-R-D-22-1 (peromyscus)

Length = $6\frac{1}{2}$ inches

Male

near genitals

Frames

0051 dorsal

0052 ventral

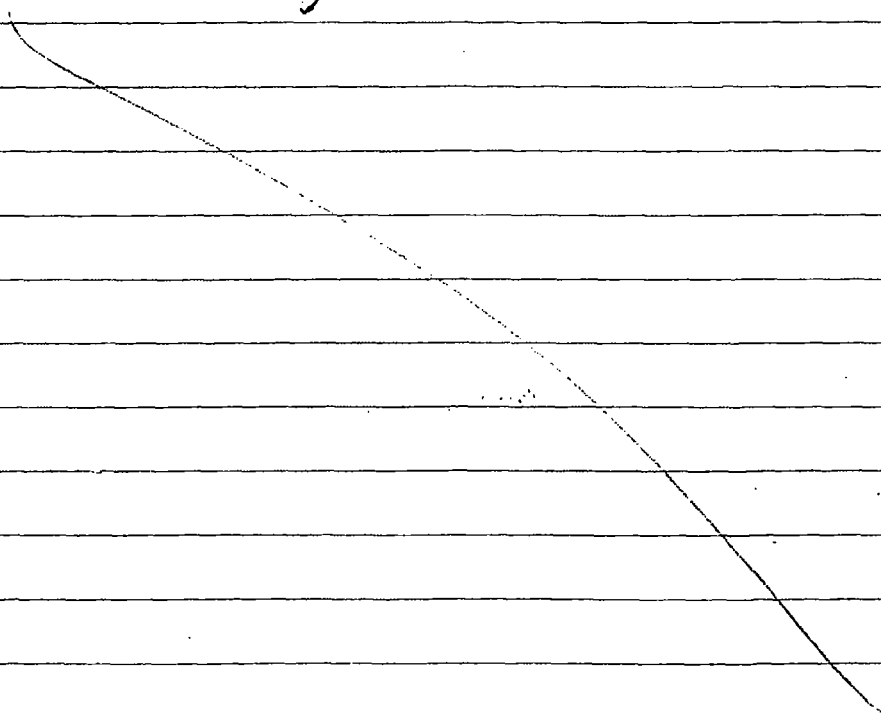
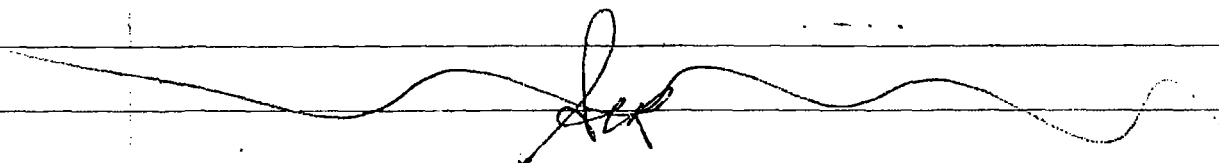
0053 inside/internal

0057 lesion

(Possible bot fly)

possible bot fly larval lesion

otherwise unremarkable internal, external



8-29-09

1. SM-R-A-62-1 (peromyscus)

Frames

Male

0058 Dorsal

0059 ventral

Length - $6\frac{3}{4}$ "

~~0060~~ insides

Bot Fly larvae, genital region

0062 internal

Larvae weight 0.4g

0064 bot larvae

unremarkable internal, external except larvae.

2. SM-R-A-49-1 (peromyscus)

Frames

0068 Dorsal

0069 ventral

Length $6\frac{3}{4}$ "

0072 internal

Male

unremarkable internal, external

3. SM-R-D-3-1 (peromyscus)

Frames

0077 Dorsal

0078 ventral

Length: $6\frac{3}{4}$ inches

Sex: Female

0079 internal

unremarkable internal, external

4. SM-R-C-3-1 (peromyscus)

Frames

Length 6 1/2 inches

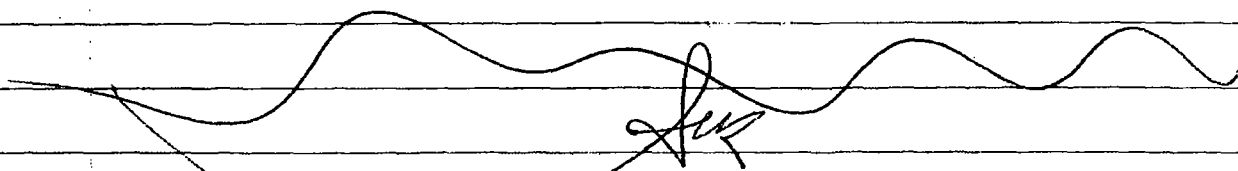
0086 Dorsal

Sex Female

0087 Ventral

0088 Internal

Remarks: Unremarkable interior, exterior



8-30-09

1. SM-R-A-55-1 (peromyscus)

Frames

length: 6 inches

sex: Male

0089 Dorsal

0090 Ventral

0093 Internal

unremarkable internal, external

2. SM-R-A-25-1 (peromyscus)

Frames

Length 5³/₄ inches

sex F

0098 Dorsal

0099 Ventral

0100 Internal

0110 Lesion

unremarkable internal, external

3. SM-S-A-21-1 (peromyscus)

Frames

length 6¹/₄ inches

sex Male

0104 Dorsal

0105 Ventral

0108 Internal

~~Bot fly larvae~~ unknown lesion near anus, fat filled looks like an opening present to external of body (like bot breather hole). Photo + sample for histologist.

4. SM-S-A-5-1 (peromyscus)

Frames

Length: 6 $\frac{3}{4}$ inches

Sex: Male

0114 Dorsal

0115 Ventral

0116 Internal

0120 Lesion (anus visible)

Bot(?) Lesion near anus. Photo taken and sample for histology. otherwise unremarkable internal and external.

5. SM-S-B-33-1 (peromyscus)

Frames

~~00 XX~~

Length 6 $\frac{1}{4}$ inch

Sex Female

0125 Dorsal

0126 Ventral

0127 Lesions (2)
external view
pus. visible on right
lesion

0128 Internal

0131 Excised lesion
w/ bot fly larvae
visible (right side lesion)

2 likely bot lesions; 1 with a small larvae inside. 1 infected with pus. Photos taken, lesions sent for histology. otherwise unremarkable internal and external. Lesions near anus.

scale calibration: 200.2 gram

6. SM-S-A-6-1 (peromyscus)

Frames

Length: $6\frac{1}{2}$ inches

0133 Dorsal

Sex: Female

0134 ventral

0137 internal

unremarkable internal and external

7. SM-S-B-28-1 (peromyscus)

Frames

Length: $5\frac{3}{4}$ "

0139 Dorsal

Sex: Male

0140 ventral

0143 internal

unremarkable internal, external

~~Signature~~

8-31-09

Scale calibration 200.2g

1. SM-S-A-3-1 (Peromyscus)

Length: $6\frac{1}{8}$ inches

Sex: male

Frames

0145 Dorsal

0146 Ventral

0149 Internal

unremarkable internal, external

2. SM-S-D-1-1 (Peromyscus)

Frames

0154 Dorsal

0155 Ventral

0156 Internal

0157 Liver with
fatty/white sections

Liver: more brown than red; ventral
surface not smooth but "textured".
White regions/patches on lobes that
appear "fatty". Samples of liver
"fatty spots" taken for histology.

Otherwise unremarkable internal, external.

3. SM-S-D-19-1 (peromyscus)

Frames

Length: $5\frac{1}{4}$ inches

Sex: Female

0164 Dorsal

0165 Ventral

0166 Internal

Unremarkable internal, external

4. SM-S-D-18-1 (peromyscus)

Frames

Length: $6\frac{1}{4}$ inches

Sex: Female

0170 Dorsal

0171 Ventral

0174 Internal

Unremarkable internal, external

5. SM-S-C-9-1

(peromyscus)

Frames:

Length: $6\frac{1}{4}$ inches

Sex: Male

0179 Dorsal

0180 Ventral

0181 Lesions (external)

0182 Internal

External lesions, pus (likely bot fly induced) near anus.
Lesions collected for histology. Otherwise
unremarkable internal, external.

B. SM-S-C-7-1 (peromyscus)

Frames:

0190 Dorsal

0191 Ventral

0193 Internal

Length: $5\frac{3}{4}$ inches

Sex: Female

unremarkable internal, external

~~fur~~

9/1/09

1. SM-S-A-31-1 (peromyscus)

Length: 6 $\frac{1}{8}$ inches

Sex: Male

Larvae weight: 0.2g

Sample ~~take~~ of larvae kept

Frames:

0194 Dorsal

0195 Ventral

0196 Lesion (Bot?) near
Anus

0199 Internal

0203 Bot larvae
(live)

Bot fly lesion and larvae. Larvae and lesion
sampled. photos of external lesion and
larvae. otherwise unremarkable internal
and external.

2. SM-S-F-1-1 (peromyscus)

Length: 7 $\frac{1}{4}$ inches

Sex: Male

Frames:

0207 Dorsal

0208 Ventral

0209 Anus discoloration
Beneath skin

significant lesions "fatty or fibrotic(?)"
throughout entire liver. Sample of liver for asbestos.
Entire liver submitted for histology. Spleen lesion
submitted for histology (too small for asbestos).

0212 Inside; note
liver lesions

Photos of liver and spleen lesions.

0214 spleen lesion

Discoloration beneath anus. Tried to get this
with rectum removal (part of large intestine excision).

APPENDIX F
FIELD PHOTOGRAPHS



Reference Transect A, Photo 1



Reference Transect A, Photo 2



Reference Transect A, Photo 3



Reference Transect A, Photo 4



Reference Transect B, Photo 1



Reference Transect B, Photo 2



Reference Transect B, Photo 3



Reference Transect B, Photo 4



Reference Transect C, Photo 1



Reference Transect C, Photo 2



Reference Transect C, Photo 3



Reference Transect C, Photo 4



Reference Transect C, Photo 5



OU3, Transect A, Photo 1



OU3, Transect A, Photo 2



OU3, Transect A, Photo 3



OU3, Transect A, Photo 4



OU3, Transect A, Photo 5



OU3, Transect A, Photo 6



OU3, Transect B, Photo 1



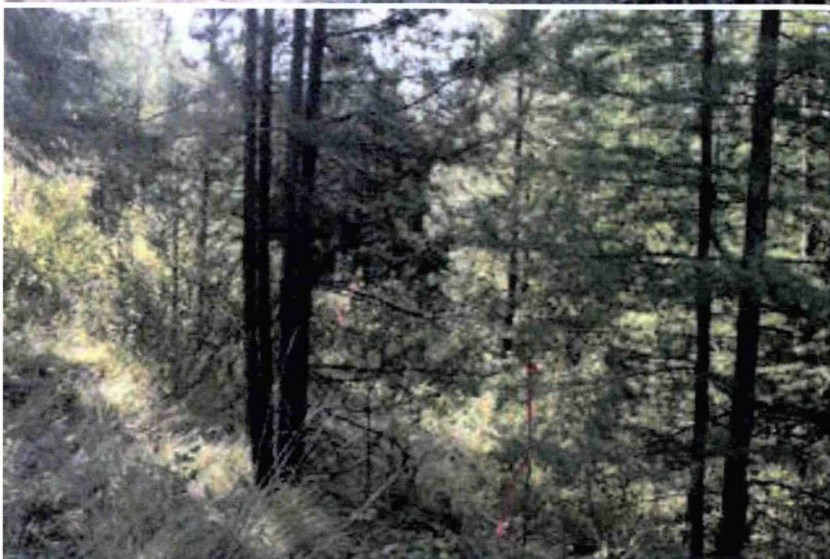
OU3, Transect B, Photo 2



OU3, Transect B, Photo 3



OU3, Transect B, Photo 4



OU3, Transect C, Photo 1



OU3, Transect C, Photo 2



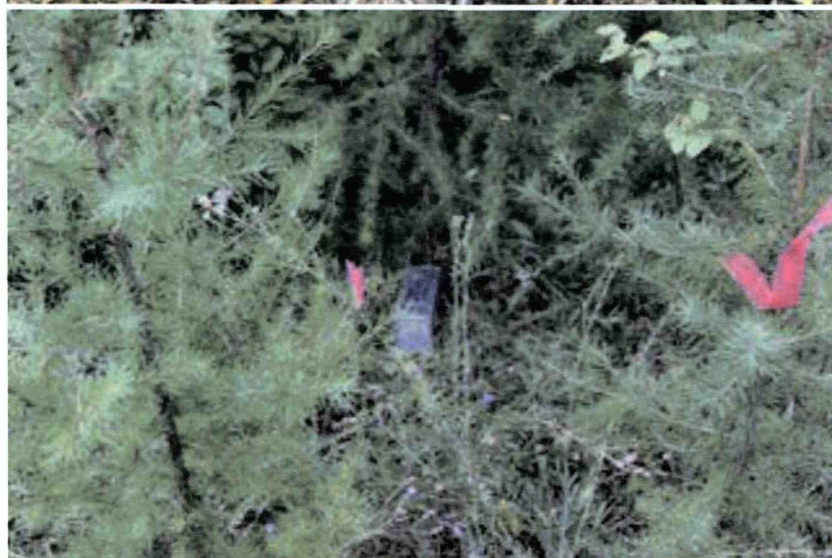
OU3, Transect C, Photo 3



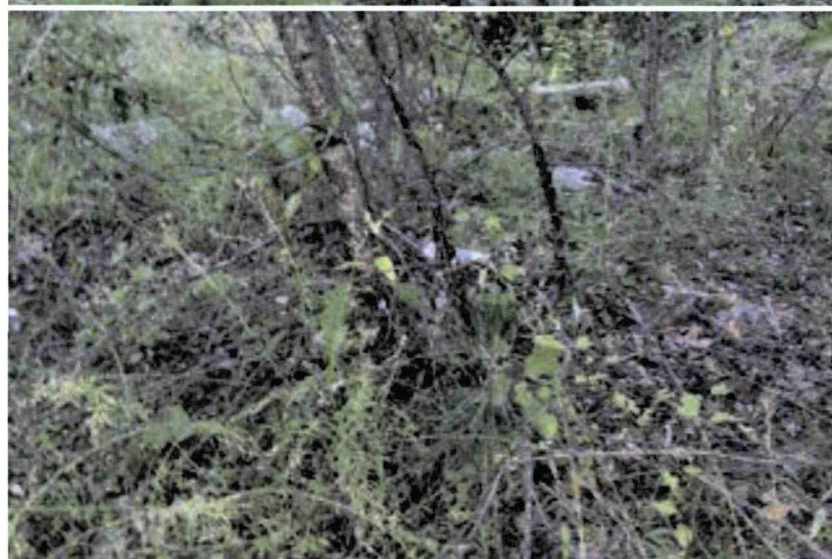
OU3, Transect C, Photo 4



OU3, Transect C, Photo 5



OU3, Transect D, Photo 1



OU3, Transect D, Photo 2



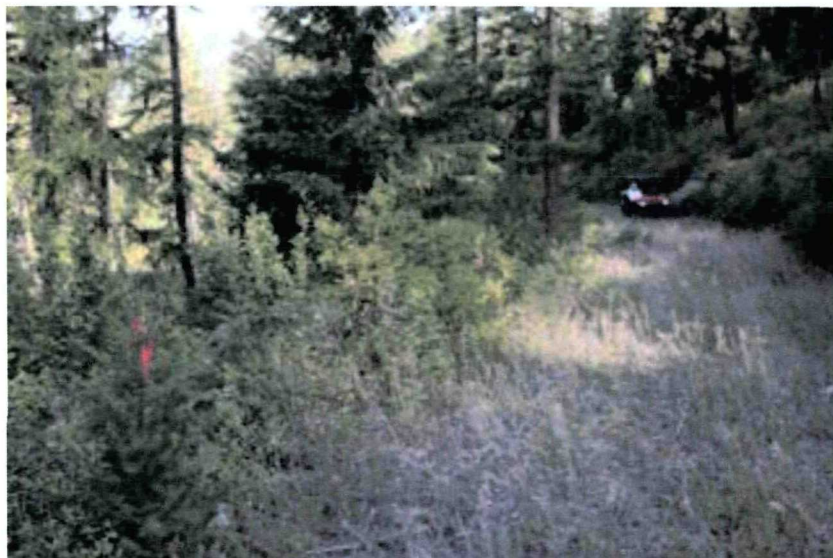
OU3, Transect D, Photo 3



OU3, Transect D, Photo 4



OU3, Transect D, Photo 5



OU3, Transect E, Photo 1



OU3, Transect E, Photo 2



OU3, Transect E, Photo 3



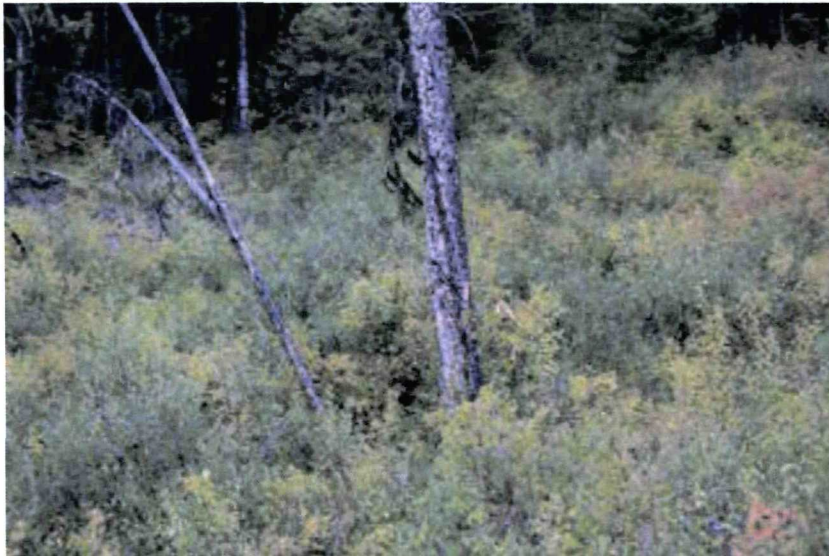
OU3, Transect E, Photo 4



OU3, Transect E, Photo 5



OU3, Transect E, Photo 6



OU3, Transect E, Photo 7



OU3, Transect F, Photo 1



OU3, Transect F, Photo 2



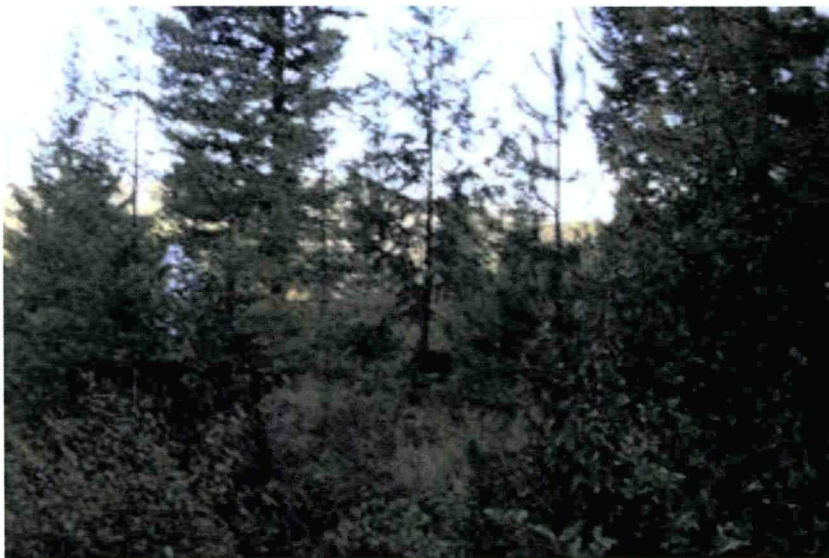
OU3, Transect F, Photo 3



OU3, Transect F2, Photo 1



OU3, Transect F2, Photo 2



OU3, Transect F2, Photo 3



OU3, Transect F2, Photo 4



OU3, Transect F2, Photo 5

APPENDIX G
FIELD DATA FOR SMALL MAMMALS

**Appendix G
Mammal Data**

Date	Transect ID	Location of Survey, Long	Trap #	Animal#	Species Collected (Common Name)	Genus/Species Code	Weight (g)	Length (cm)	Sex	Field Logbook Pg. No.	Alive	Number Captured	Number Kept	Trap Log Sheet	UTM W Long	UTM N Lat	Notes
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	5	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.4	15.2	M	2	Yes	1	1	1	609211	5369865	
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	17.1	16.5	F	2	Yes	1	1	1	609197	5369853	
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	26	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.5	14.6	F	2	Yes	1	1	1	609168	5369794	
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	27	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.1	15.9	F	2	Yes	1	1	1	609165	5369782	
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	20.1	17.1	M	2	Yes	1	1	1	609159	5369773	Bot fly larvae noted in FSDS but not weighed.
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	32	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.4	15.2	F	2	Yes	1	1	1	609157	5369760	
8/27/2009	SM-R-A	Kootenai National forest (Transect A)	40	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.1	15.9	F	3	Yes	1	1	1	609141	5369726	
8/27/2009	SM-R-B	Kootenai National forest (Transect B)	1	1	<i>Neotoma cinerea</i> (Bushy-tailed woodrat)	BTWR	Unk	Unk	Unk	3	Yes	1	0	1	607891	5368638	
8/27/2009	SM-R-B	Kootenai National forest (Transect B)	15	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.5	16.5	F	3	Yes	1	1	1	607888	5368601	
8/27/2009	SM-R-B	Kootenai National forest (Transect B)	17	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	3	Yes	1	0	1	607882	5368566	
8/27/2009	SM-R-B	Kootenai National forest (Transect B)	29	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	4	Yes	1	0	1	607868	5368511	
8/28/2009	SM-R-A	Kootenai National forest (Transect A)	26	2	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.8	14.6	M	6	Yes	1	1	1	609165	5369792	
8/28/2009	SM-R-A	Kootenai National forest (Transect A)	31	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	20.6	17.8	M	6	Yes	1	1	1	609156	5369770	
8/28/2009	SM-R-A	Kootenai National forest (Transect A)	36	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	20.8	17.8	F	5	Yes	1	1	1	609127	5369752	
8/28/2009	SM-R-A	Kootenai National forest (Transect A)	56	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.8	17.8	F	5	Yes	1	1	1	609107	5368669	UTM N_Lat was 5363669 in field note book, number presented is correct
8/28/2009	SM-R-A	Kootenai National forest (Transect A)	57	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	20	17.8	F	5	Yes	1	1	1	609109	5369664	
8/28/2009	SM-R-C	Kootenai National forest (Transect C)	14	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.2	17.1	F	7	Yes	1	1	1	608684	5368050	
8/28/2009	SM-R-C	Kootenai National forest (Transect C)	20	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.4	16.5	M	7	Yes	1	1	1	608679	5368032	
8/28/2009	SM-R-C	Kootenai National forest (Transect C)	21	1	<i>Neotoma cinerea</i> (Bushy-tailed woodrat)	BTWR	Unk	Unk	Unk	7	Yes	1	0	1	608680	5368051	UTM N_Lat was 5369051 in field note book, number presented is correct
8/28/2009	SM-R-D	Kootenai National forest (Transect D)	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	10.7	14.6	F	8	Yes	1	1	1	609134	5369943	
8/28/2009	SM-R-D	Kootenai National forest (Transect D)	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.2	15.6	F	8	Yes	1	1	1	609103	5369881	
8/28/2009	SM-R-D	Kootenai National forest (Transect D)	22	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.3	16.5	M	8	Yes	1	1	1	609108	5369892	
8/28/2009	SM-R-D	Kootenai National forest (Transect D)	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.3	17.1	F	8	Yes	1	1	1	609120	5369920	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	10.4	14.9	M	11	Yes	1	1	2	609209	5369885	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.6	14.9	F	11	Yes	1	1	2	609179	5369823	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	25	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	11	Yes	1	0	1	609166	5369791	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	48	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	18	17.8	F	10	Yes	1	1	1	609121	5369697	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	49	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	19.4	17.1	M	10	Yes	1	1	1	609120	5369698	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	57	2	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	17	17.1	M	10	Yes	1	1	1	609108	5369662	
8/29/2009	SM-R-A	Kootenai National forest (Transect A)	62	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	19.6 (a)	17.1	M	10	Yes	1	1	1	609097	5369636	Bot fly larvae weight, 0.4g.
8/29/2009	SM-R-C	Kootenai National forest (Transect C)	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.4	16.5	F	14	Yes	1	1	1	608707	5368063	
8/29/2009	SM-R-C	Kootenai National forest (Transect C)	10	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	17.4	17.5	F	13	Yes	1	1	1	608673	5368039	
8/29/2009	SM-R-C	Kootenai National forest (Transect C)	20	2	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.7	15.2	F	13	Yes	1	1	1	608677	5368035	
8/29/2009	SM-R-C	Kootenai National forest (Transect C)	21	2	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	13	Yes	1	0	1	608683	5368044	
8/29/2009	SM-R-D	Kootenai National forest (Transect D)	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.8	17.1	F	12	Yes	1	1	1	609129	5369938	
8/29/2009	SM-R-D	Kootenai National forest (Transect D)	23	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	12	Yes	1	0	1	609108	5369893	

Appendix G
Mammal Data

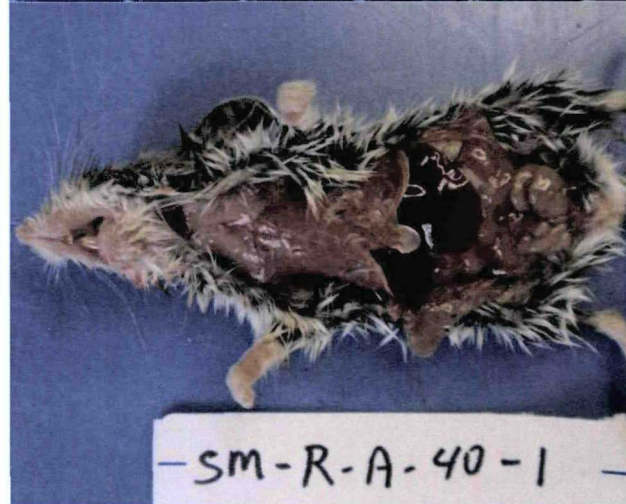
Date	Transect ID	Location of Survey, Long	Trap #	Animal#	Species Collected (Common Name)	Genus/Species Code	Weight (g)	Length (cm)	Sex	Field Logbook Pg. No.	Alive	Number Captured	Number Kept	Trap Log Sheet	UTM W Long	UTM N Lat	Notes
8/29/2009	SM-R-D	Kootenai National forest (Transect D)	36	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	12	Yes	1	0	1	609138	5369954	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.2	14.6	F	17	Yes	1	1	2	609197	5369858	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13	17.1	M	17	Yes	1	1	2	609178	5369817	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	25	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.5	14.6	F	16	Yes	1	1	2	609168	5369790	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	26	3	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	18.1	17.8	F	16	Yes	1	1	2	609168	5369789	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	29	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	16	Yes	1	0	2	609159	5369774	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	30	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	16	Yes	1	0	2	609161	5369767	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	50	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	16	Yes	1	0	2	609118	5369689	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	53	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	16	Yes	1	0	2	609112	5369679	
8/30/2009	SM-R-A	Kootenai National forest (Transect A)	55	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.6	15.2	M	16	Yes	1	1	2	609111	5369671	In the small mammal trap log the YPCM was assigned to trap 55. However, the field log book (and FSDS) correctly assigns a DEMO to trap 55 and a YPCM to trap 53
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14	16.2	M	18	Yes	1	1	1	619001	5367296	
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	5	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	19.8	17.1	M	18	Yes	1	1	1	619001	5367294	
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	6	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.8	16.5	F	18	Yes	1	1	1	619006	5367288	
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	17.4 (a)	16.5	M	18	Yes	1	1	1	619027	5367279	Bot fly larvae weight, 1.1g.
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	12	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.9	15.9	M	18	Yes	1	1	1	619032	5367276	
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	21	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.2	15.9	M	18	Yes	1	1	1	619065	5367254	
8/30/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.8	15.2	F	18	Yes	1	1	1	619094	5367230	
8/30/2009	SM-S-B	Libby Superfund Site, OU3 (Transect B)	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13	15.2	F	19	Yes	1	1	1	618592	5367601	
8/30/2009	SM-S-B	Libby Superfund Site, OU3 (Transect B)	6	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.9	14.9	M	19	Yes	1	1	1	618590	5367579	
8/30/2009	SM-S-B	Libby Superfund Site, OU3 (Transect B)	28	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.3	14.6	M	19	Yes	1	1	1	618575	5367564	
8/30/2009	SM-S-B	Libby Superfund Site, OU3 (Transect B)	33	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.9	15.9	F	19	Yes	1	1	1	618581	5367581	Bot fly larvae noted in FSDS but not weighed.
8/30/2009	SM-S-B	Libby Superfund Site, OU3 (Transect B)	35	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	10.5	14.6	M	19	Yes	1	1	1	618582	5367589	
8/31/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	2	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.1	15.9	F	22	Yes	1	1	1	618990	5367288	
8/31/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.7	15.6	M	22	Yes	1	1	1	618993	5367288	
8/31/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	4	1	<i>Zapus princeps</i> (Western jumping mouse)	WJMO	Unk	Unk	Unk	22	Yes	1	0	1	619003	5367287	
8/31/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	5	2	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.6	17.1	M	22	Yes	1	1	1	619005	5367288	In the FSDS this is animal 2. The trap log had animal 1, but it was 2 for this position
8/31/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	17	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	22	Yes	1	0	1	619055	5367263	Entered as WPCM in trap log, should be YPCM
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	7	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.1	14.6	F	23	Yes	1	1	1	618586	5367873	
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	17.6	15.9	M	23	Yes	1	1	1	618581	5367880	
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.2	14.6	F	23	Yes	1	1	1	618575	5367881	
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	13	1	<i>Neotoma cinerea</i> (Bushy-tailed woodrat)	BTWR	Unk	Unk	Unk	23	Yes	1	0	1	618568	5367886	
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	16	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.1 (a)	15.2	F	23	Yes	1	1	1	618557	5367899	Bot fly larvae weights, 0.8g and 0.1g.
8/31/2009	SM-S-C	Libby Superfund Site, OU3 (Transect C)	17	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	Unk	Unk	Unk	23	Yes	1	0	1	618550	5367891	Lost this one when checking trap
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.5	16.5	M	21	Yes	1	1	1	617633	5367615	
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.5	13.3	F	21	Yes	1	1	1	617640	5367624	

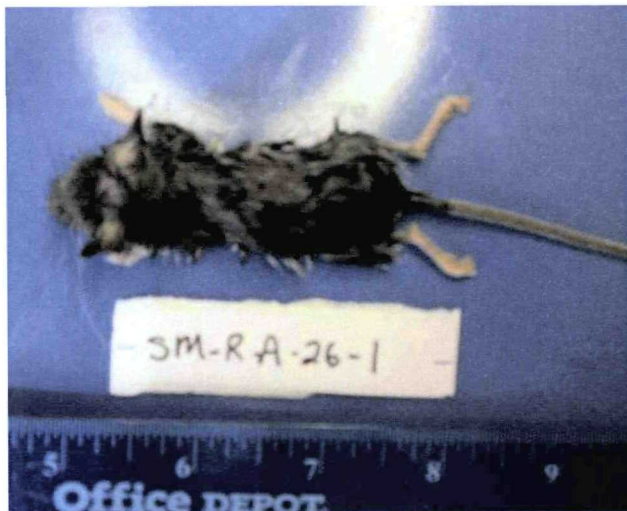
Appendix G
Mammal Data

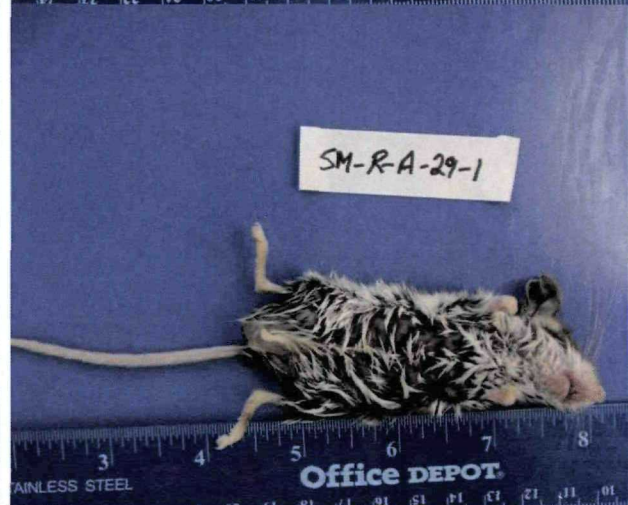
Date	Transect ID	Location of Survey, Long	Trap #	Animal#	Species Collected (Common Name)	Genus/Species Code	Weight (g)	Length (cm)	Sex	Field Logbook Pg. No.	Alive	Number Captured	Number Kept	Trap Log Sheet	UTM W Long	UTM N Lat	Notes
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	7	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.5	15.2	F	21	Yes	1	1	1	617653	5367630	
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	10	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.1	14.6	F	21	Yes	1	1	1	617659	5367624	
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.7	15.9	M	21	Yes	1	1	1	617670	5367627	
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	13.2	15.9	F	21	Yes	1	1	1	617663	5367588	
8/31/2009	SM-S-D	Libby Superfund Site, OU3 (Transect D)	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	11.7	13.3	F	21	Yes	1	1	1	617664	5367589	
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	4	2	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.7	15.6	F	26	Yes	1	1	1	619000	5367288	
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	8	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	1	619010	5367276	Entered as WPCM in trap log, should be YPCM
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.2 (a)	16.2	M	26	Yes	1	1	1	619016	5367286	Bot fly larvae weight, 0.2g.
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	14	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	1	619039	5367271	Entered as WPCM in trap log, should be YPCM
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	17	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.1 (a)	16.2	F	26	Yes	1	1	1	619054	5367266	In the FSDS this is animal 1. The trap log had animal 1 as well, but it was 2 for this location for all mammals. The 1st animal was a chipmunk and the 2nd animal was the 1st deer mouse. Bot fly larvae weight, 1.0g.
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	23.7	18.7	F	26	Yes	1	1	2	619060	5367257	
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	25	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	2	619086	5367239	Entered as WPCM in trap log, should be YPCM
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	31	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	16.0 (a)	15.6	M	26	Yes	1	1	2	619107	5367230	Bot fly larvae weight, 0.2g.
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	32	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	2	619112	5367226	
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	33	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	2	619111	5367228	
9/1/2009	SM-S-A	Libby Superfund Site, OU3 (Transect A)	34	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	26	Yes	1	0	2	619117	5367224	
9/1/2009	SM-S-E	Libby Superfund Site, OU3 (Transect E)	7	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	27	Yes	1	0	1	619514	5366725	
9/1/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	20.7	18.4	M	25	Yes	1	1	1	618391	5367198	
9/1/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	2	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.8	16.5	M	25	Yes	1	1	1	618395	5367200	
9/2/2009	SM-S-E	Libby Superfund Site, OU3 (Transect E)	12	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.6		M	29	Yes	1	1	1	619520	5366734	The last mouse processed on 9/2/09 has an incomplete animal number in the lab notebook. However the description recorded on the FSDS for SM-S-E-12-1 is the same as the description of the last mouse of 9/2/09 in the lab notebook.
9/2/2009	SM-S-E	Libby Superfund Site, OU3 (Transect E)	13	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	29	Yes	1	0	1	619516	5366738	
9/2/2009	SM-S-E	Libby Superfund Site, OU3 (Transect E)	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	19.3	17.5	M	29	Yes	1	1	1	619504	5366761	
9/2/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	14.6	15.6	M	28	Yes	1	1	1	618379	5367212	
9/2/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	7	1	<i>Tamias amoenus</i> (Yellow-pine Chipmunk)	YPCM	Unk	Unk	Unk	28	Yes	1	0	1	618363	5367214	YPCM was assigned trap 8 in small mammal trap log but trap 7 in field log book. Since GPS was taken for trap 7, this is the number.
9/2/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	15	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	12.6	15.6	F	28	Yes	1	1	1	618355	5367226	
9/2/2009	SM-S-F	Libby Superfund Site, OU3 (Transect F)	16	1	<i>Peromyscus maniculatus</i> (Deer mouse)	DEMO	15.1	14.9	M	28	Yes	1	1	1	618354	5367227	

(a) = Weight corrected for bot fly larvae.

APPENDIX H
LABORATORY PHOTOGRAPHS



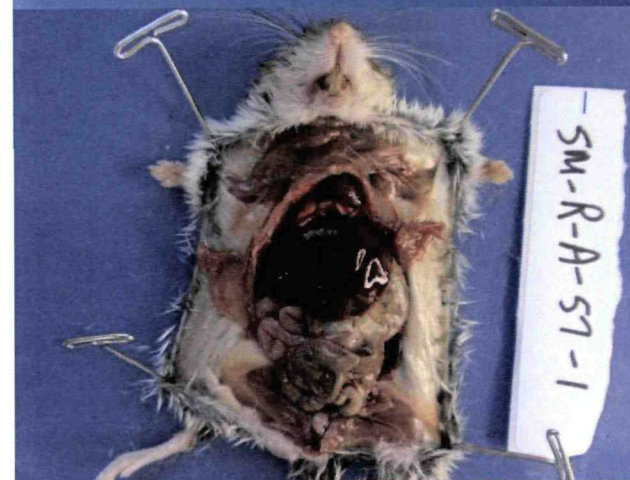


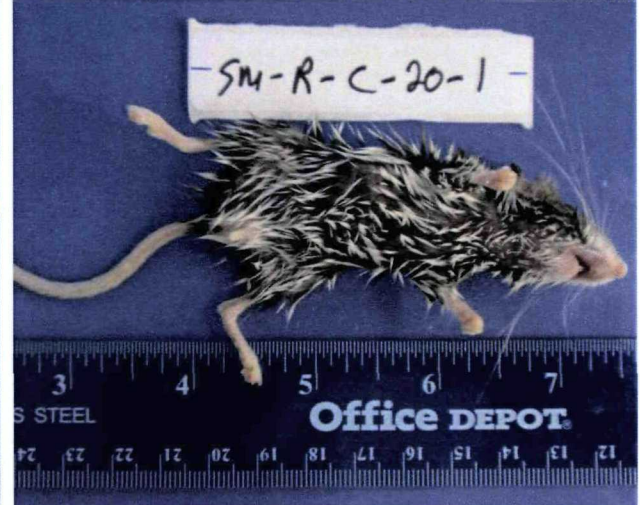
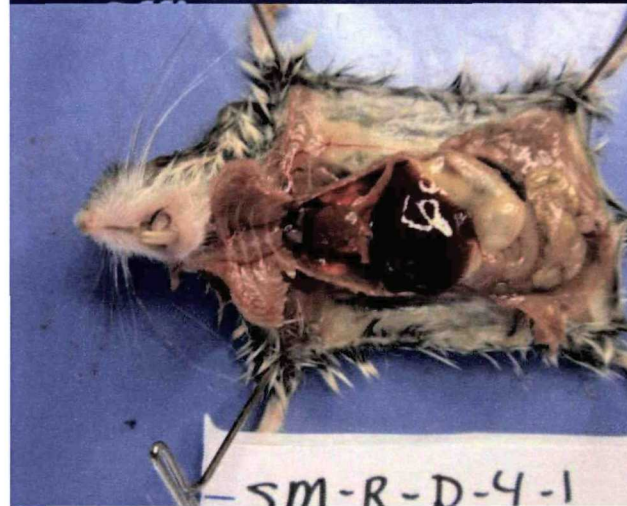




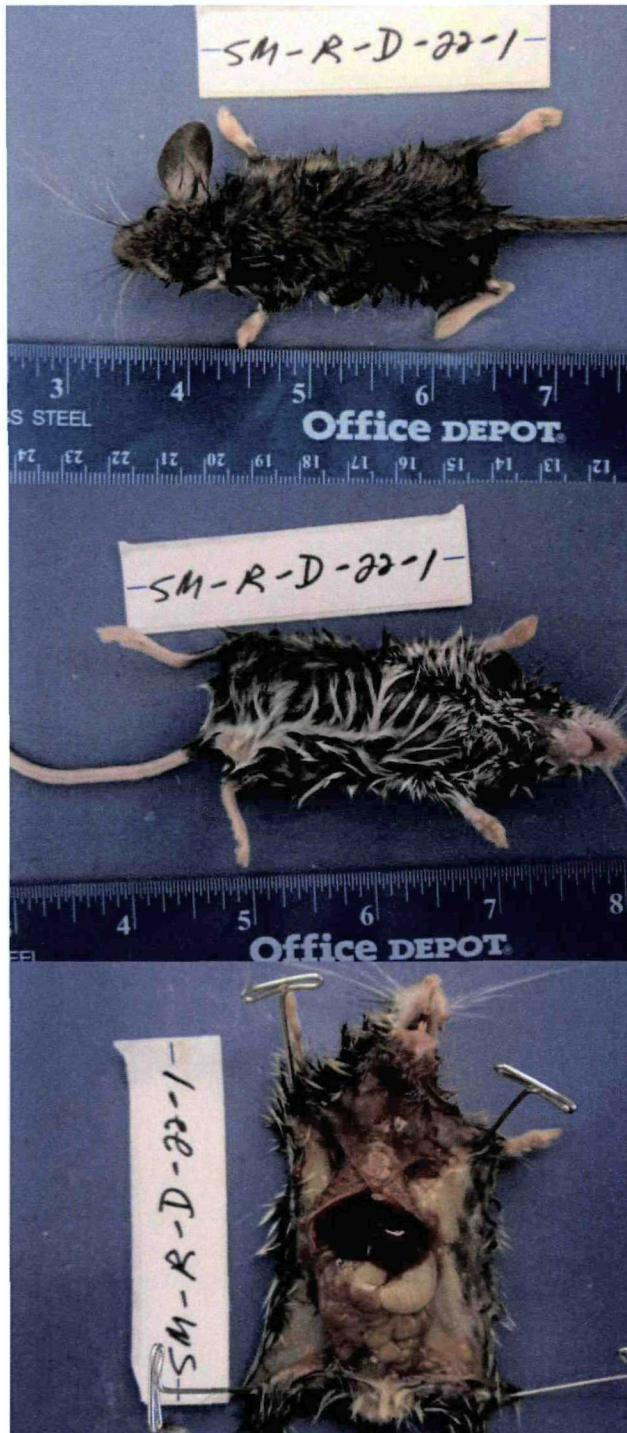


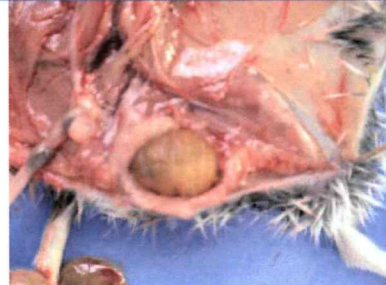


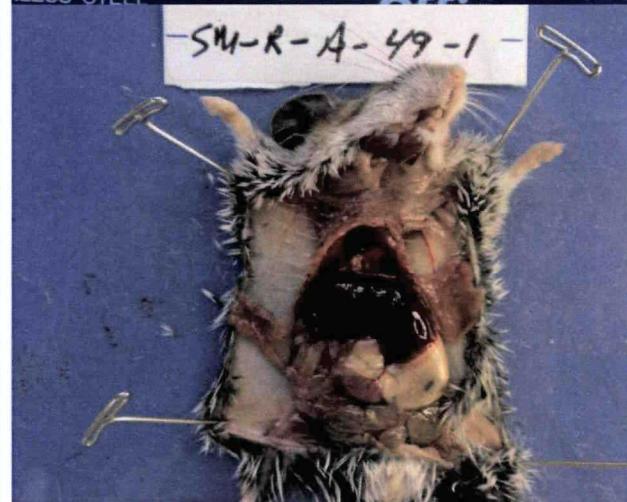




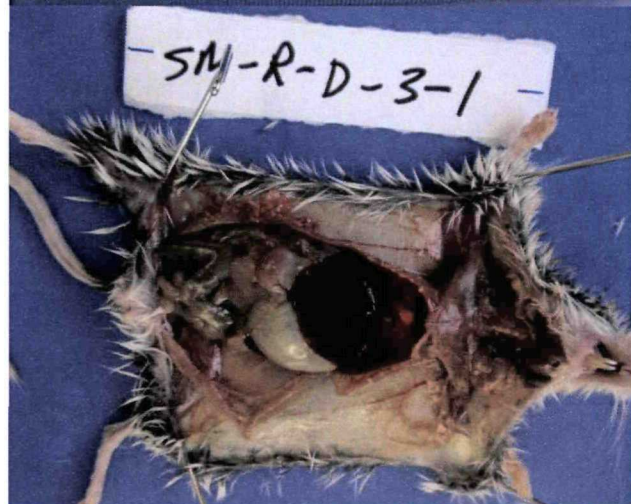




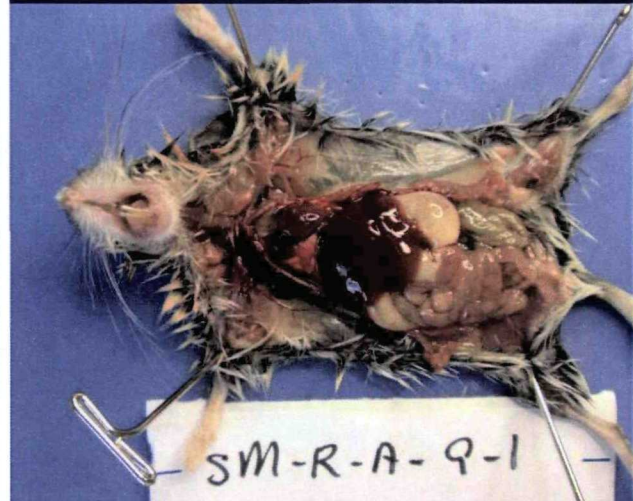


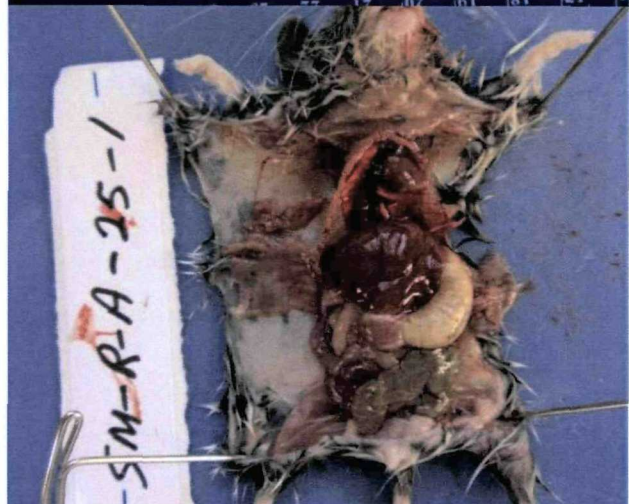
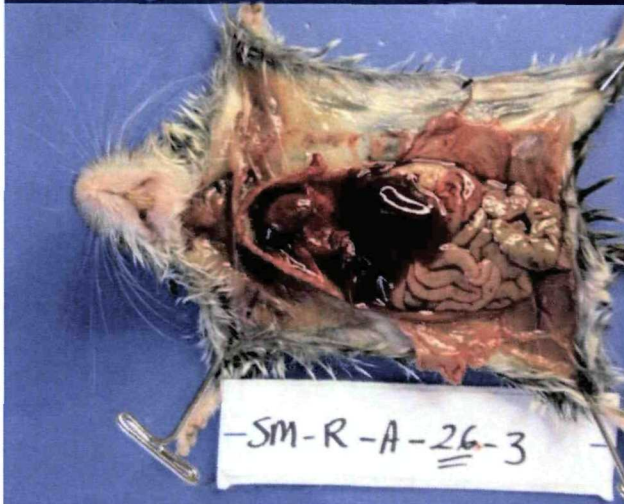


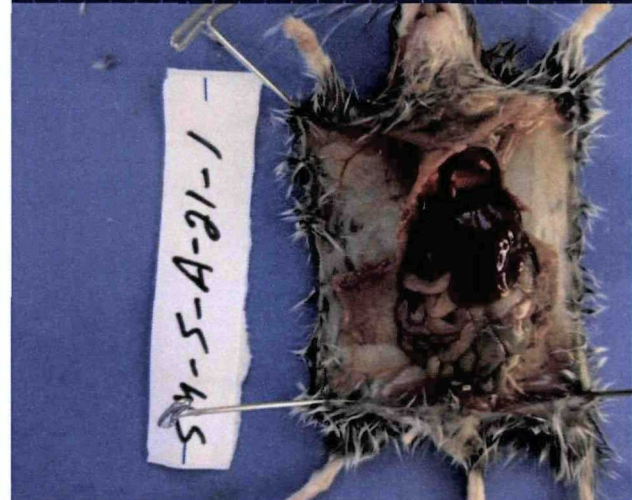




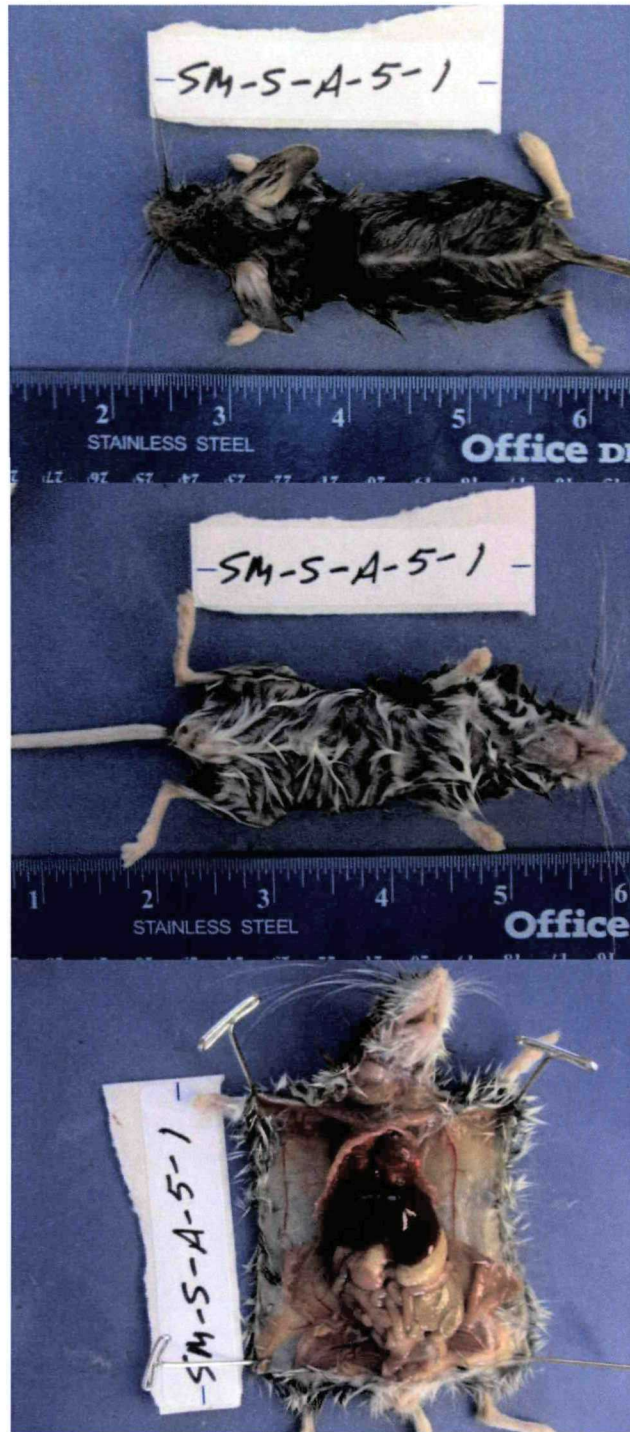


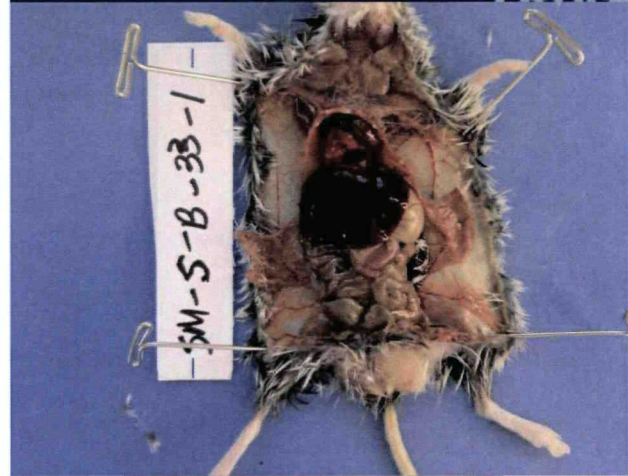




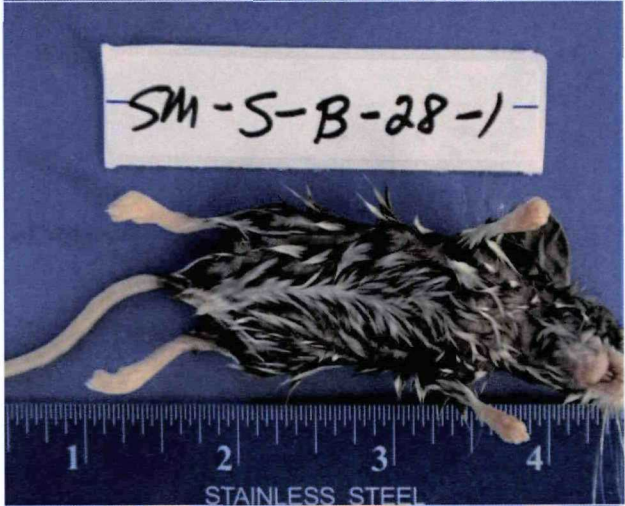








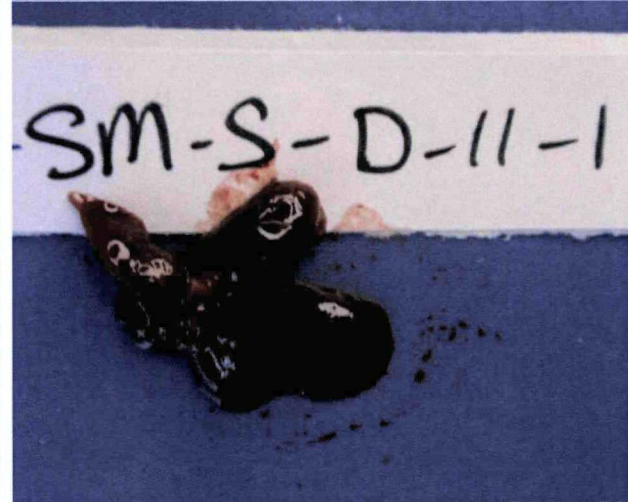
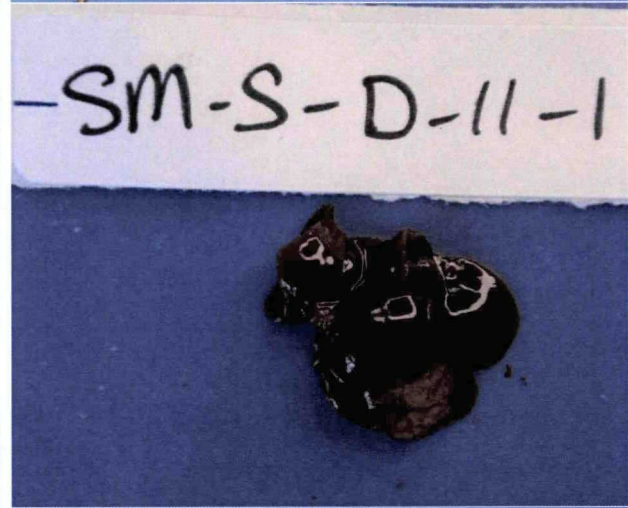
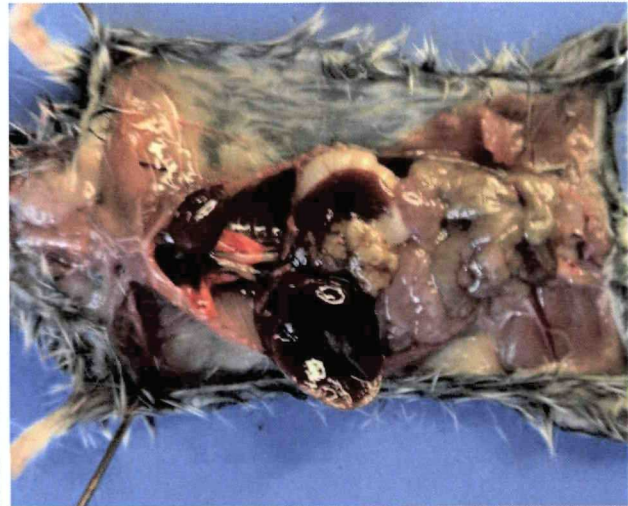








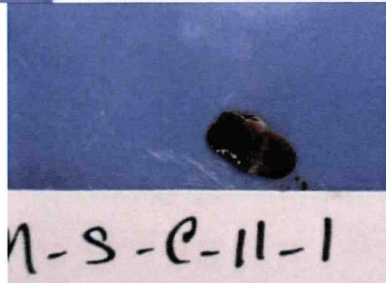
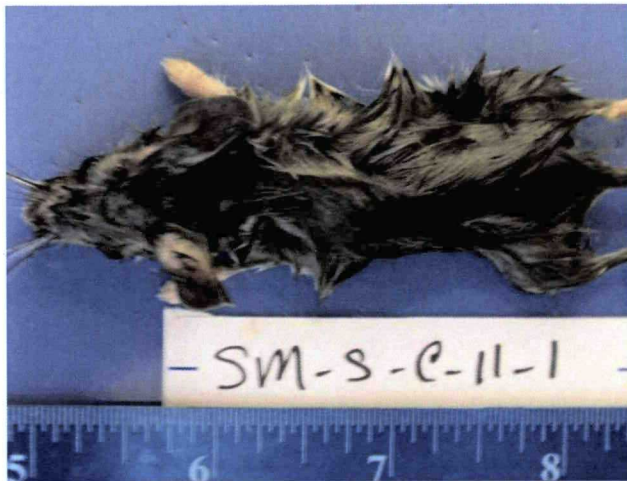




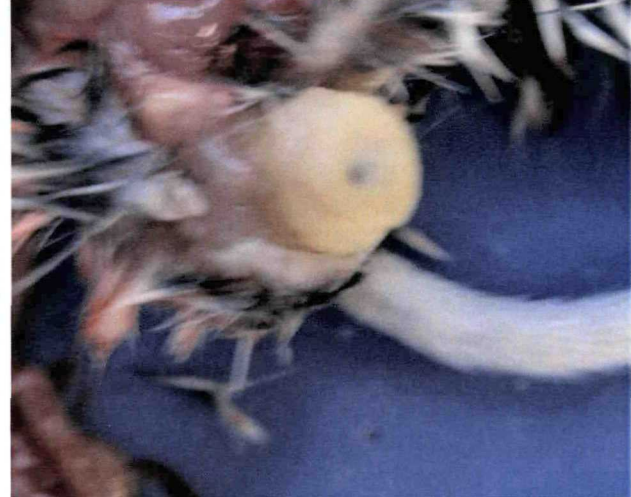
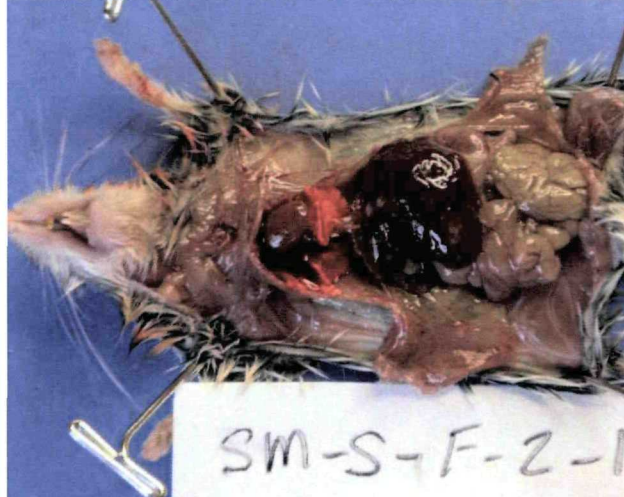




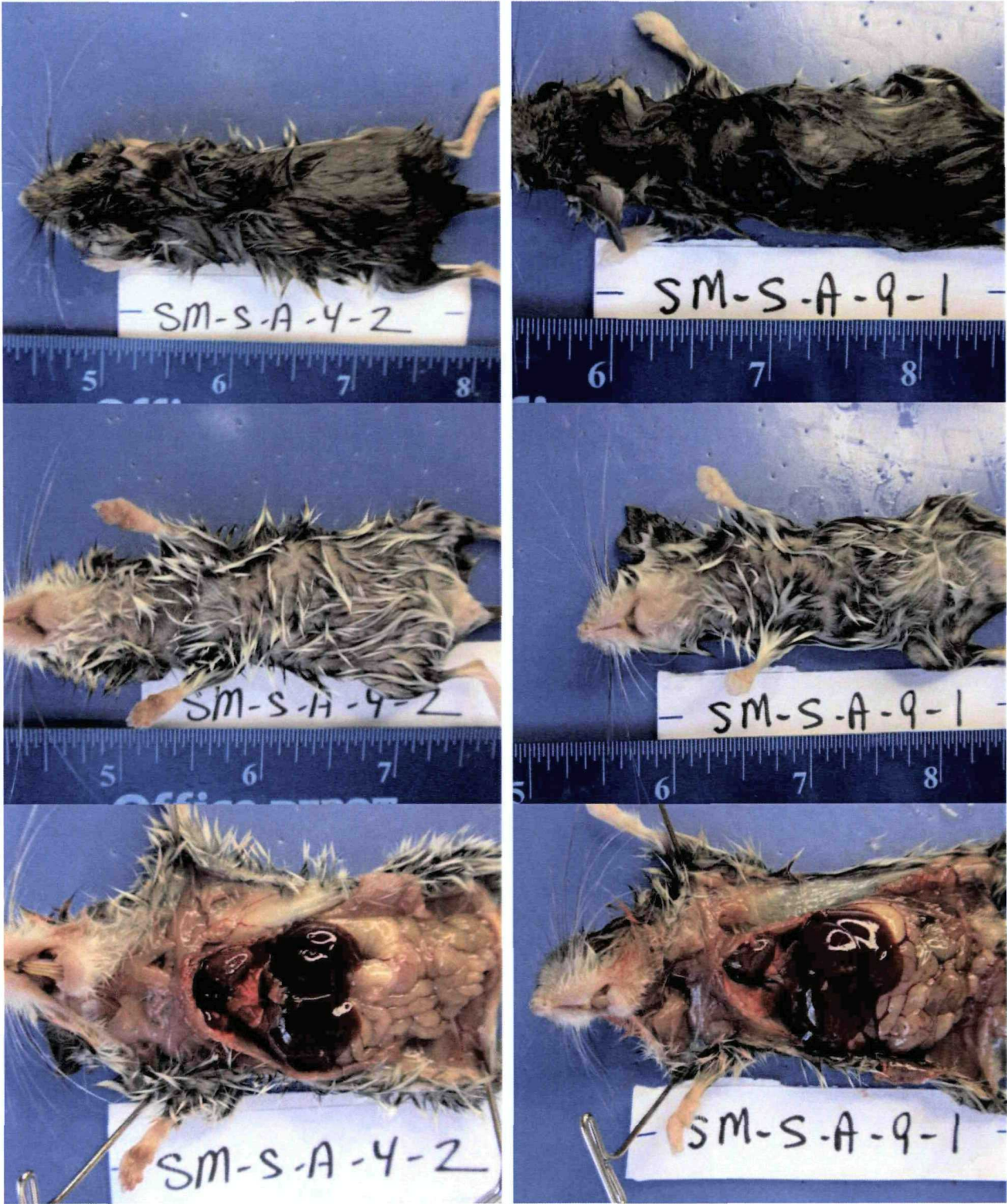


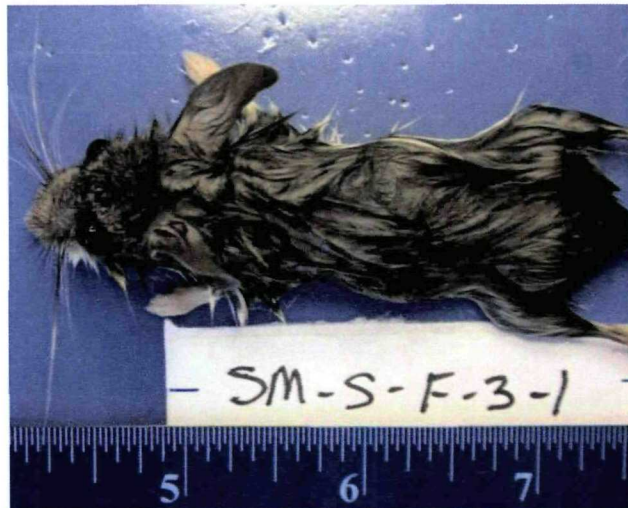




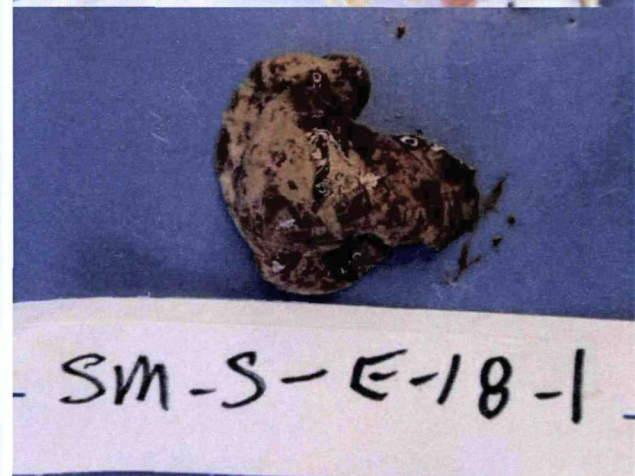


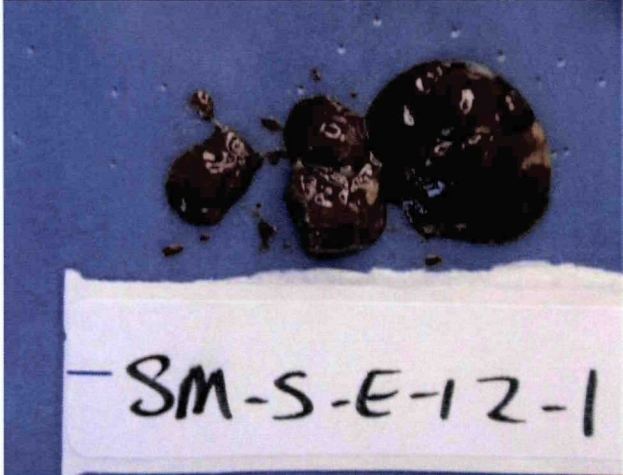
















APPENDIX I
NORTHWEST ZOOPATH HISTOLOGY REPORT

Libby Superfund Site, Operable Level 3

Small Mammal Histopathology Report

Study Conclusion, February 26, 2010

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Introduction

Experimental studies characterizing the pathologic affects of asbestos exposure in rodents have been documented. Pathologic changes in rodents occur following oral and inhalation exposure and parallel those seen in humans.^{5,11,12} In rodents and primates, asbestos-induced lesions are dependent on dose, fiber type and fiber length.^{4,6,11,16, 19,26} Pathologic changes in the lungs following aerosol exposure in rodents include epithelial hypertrophy and proliferation, alveolar macrophage infiltrates, pleural effusion, interstitial and pleural fibrosis, and development of bronchogenic carcinoma or mesothelioma.^{4,11,19,21} Pathologic changes in the alimentary tract include gastric and intestinal adenomatous polyps and epithelial neoplasms.¹⁵⁻¹⁸ Over time, translocation of fibers occurs along vascular and lymphatic channels to involve tissues removed from original sites of exposure.¹⁴ There is also some evidence to suggest that translocation of fibers may be involved in neoplastic alterations in the chromaffin cells of the adrenal gland, and in the C-cells of the thyroid associated with experimental exposure to asbestos in rodents.^{16,17}

Asbestos at the Libby site is a mixture of several amphibole fibers.²⁵ Experimental studies in C57Bl/6 mice indicate that asbestos from the Libby site causes pulmonary fibrosis similar to but less severe than crocidolite.²⁵ To our knowledge, no studies have been conducted on effects of environmental asbestos in wild animals. Although it has been shown that rats are the most suitable animal model for asbestosis, mice are susceptible to the toxic affects of asbestos under experimental conditions, and produce the typical spectrum of lesions associated with asbestosis and asbestos-induced neoplasia.^{11,12}

The purpose of this histologic investigation was to evaluate wild caught deer mice (*Peromyscus maniculatus*) from the different areas of the Libby Superfund Site as well as from control sites for any light microscopic lesions in the respiratory tract, alimentary tract, adrenal gland or thyroid gland that would suggest or confirm exposure to asbestos. The latter tissues were identified as "target tissues" for the purpose of this study.²⁸ Lesions sampled and submitted by necropsy staff were also similarly reviewed.

Materials and Methods

Select tissues collected from necropsied deer mice (*Peromyscus maniculatus*) in the field were preserved in labeled containers with 10% neutral buffered formalin. Labels included mouse identification and site identification, and these labels were retained on the glass slides and worksheet for each specimen throughout the study in accordance with the Histology Standard Operating Procedure (SOP) established for this study.²⁸ Target tissues included the entire respiratory and alimentary tracts, thyroid, and adrenals. For some animals, liver, spleen and botfly larva-associated perirectal abscesses were also submitted for histology. Additionally, a number of different tissues were incidentally harvested along with the target tissues, though not targeted specifically by the necropsy personnel, including salivary gland, thymus, lymph nodes (mesenteric, intrathoracic and tracheal), parathyroid, pancreas, adipose and skin. Tissues were embedded in blocks, processed routinely, sectioned at 5 microns, and stained with hematoxylin and eosin according to the histology SOP.²⁸

Generally, transverse sections of the trachea, left mainstem bronchus and left lung were processed in block 1. Left lung was sectioned three times, to include rostral, middle and caudal portions, and the sections were inked yellow, black and red respectively for microscopic identification. Transverse sections through the right mainstem bronchus, and sections through the middle of cranial, middle, caudal and post caval¹ right lung were processed in block 2, and the sectioned were inked yellow, black and red

¹ For the right lung lobe the terms cranial, middle, caudal and post caval are equivalent to the terms apical, azygous, cardiac and diaphragmatic as specified in the histology SOP.

respectively for microscopic identification. The post caval lung was identified as the tissue without ink. Longitudinal sections of the esophagus and stomach were processed in block 3. Transverse sections of the larynx and thyroid, and longitudinal sections of the adrenal were processed in block 4. Longitudinal and oblique sections of the duodenum, jejunum, ileum, cecum and colon were processed in block 5. Longitudinal sections of the rectum and anus were processed in an "add block". Additional add blocks were prepared from re-trimmed tissues if the target tissues were not present in the original blocks after sectioning at several levels.

All tissue sections were examined by conventional light microscopy at 20x, 200x and 400x magnification, and lung sections were also examined with polarized light at 20x and 400x magnification. Lesions in each tissue were documented by distribution and severity.²⁸ Cellular constituents of inflammatory processes, deposition disorders, infectious agents, viral inclusions, foreign bodies and proliferative processes were also recorded. Parasites were recorded based on general morphologic classifications, and were classified to genus if possible.

All tissues were tabulated and scored based on lesion severity and microscopic distribution² as follows:

<u>Lesion Type</u>	<u>Score Assigned</u>
No lesion	0
Minimal lesion	1
Mild lesion	2
Moderate lesion	3
Marked lesion	4
Severe lesion	5
<u>Lesion Distribution</u>	<u>Score Assigned</u>
Focal	0 (no additional score other than lesion identity)
Multifocal	1
Diffuse	2

Parasites were scored as 1 per species. Other lesions such as granulomas, hemosiderin, foreign bodies, etc, were scored as 1. A cumulative (additive) score was assigned to each target tissue examined.

The lesion score for each tissue was multiplied by a pathos factor of either 1 or 2 to address lesion pathology depending on whether the tissue had lesions that were similar to or overlapped those of asbestos (factor of 2) or other (non-asbestos) causes (factor of 1). For each animal, the tissue scores were summed and the total divided by the number of tissues evaluated to obtain an animal numeric score.

² The final histology SOP did not specify a lesion distribution scoring procedure, which is identified herein.

Thus, a lung section with the following lesions: "1mf lp pv pb ip, 1 f pv hemosid, 1 f schizont, euthan hemorrhage" would be scored as follows:

1 = minimal, 1

mf = multifocal, because these are multifocal, an additional point is added	1
lp = lymphoplasmacytic inflammatory cell descriptor, no score	0
pv = perivascular cuffing, first lesion, understood and already scored as minimal	0
pb = minimal peribronchiolar cuffing, second lesion,	1
ip = minimal interstitial pneumonia, third lesion,	1
1 focal pv hemosid = is a single small focus of hemosiderosis around a blood vessel,	1
1 f schizont = a single schizont in a an endothelial cell,	1
euthan hemorrhage = artifactual and not a true lesion, no points	0
cumulative score for this tissue (additive)	5
Pathos multiplication factor = 1 (no lesions that overlap asbestos-related lesions)	1

Total lesion score for this tissue = 5

Results

Lesion scores (severity, distribution, parasite, granuloma, etc) for each mouse are summarized in Appendix 1. Descriptions of histological findings are discussed below.

Respiratory tract

Histologic changes in the respiratory tract are summarized in Table 1. Lesions were most prevalent in the caudal right lung lobe and least prevalent in the larynx. Inflammation was the most common lesion in all portions of the respiratory tract. Inflammation in the upper respiratory tract was largely confined to the submucosa, and mostly lymphoplasmacytic, with occasional neutrophils and eosinophils. Perivascular cuffing was the most prevalent form of inflammation in the lungs, followed by peribronchiolar cuffing, lymphonodular hyperplasia and interstitial pneumonia, respectively. Inflammation was mostly lymphoplasmacytic with occasional neutrophils, eosinophils or histiocytes. Perivascular cuffing was distributed fairly evenly throughout the left and right lobes. Peribronchiolar cuffing was more prevalent in the caudal lungs than in the cranial lungs. Lymphonodular hyperplasia was present throughout the respiratory tract and no discernable pattern was apparent, except for a somewhat higher prevalence on the pleural surfaces of the right caudal and post caval lobes than in other lobes. Interstitial pneumonia was distributed fairly evenly throughout the left lung and all right lung lobes. Bronchopneumonia was seen in only two mice, was mild, and was eosinophilic. Two mice had single microgranulomas in a lung lobe for which the cause was not apparent. Nematodes or nematode larvae were seen in tracheal lumen of one mouse and in the airway lumina of four mice. One mouse had a *Capillaria* egg embolus in a pulmonary vein, with associated vasculitis. A few mice had identifiable protozoa, including Sarcocystis-like or

Hepatozoon-like schizonts in the endothelium. A few mice also had granulomas oriented around *Besnoitia* cysts. Intranuclear inclusions resembling viral inclusions were seen in the endothelial cells of a few mice. One mouse had a partially organized thromboembolus in a pulmonary vein oriented around a hair shaft. Small foci of hemosiderosis (macrophages containing yellow pigment interpreted as hemosiderin) were seen in foci of inflammation in a few mice. Syncytia, multinucleated cells likely of epithelial origin, were noted in very low numbers within alveolar lumina of a few mice. Pleural inflammation, primarily lymphoplasmacytic infiltrates, was seen in a few mice. A few small foci of fibrosis were seen in the pleura of a few mice, one of which was associated with some mild mesothelial cell hypertrophy. No asbestos fibers were seen by light microscopy.

Alimentary tract

Histologic lesions in the alimentary tract are summarized in Table 2. Very few lesions were seen in the esophagus or stomach, mostly perivascular cuffing in the mucosal or muscular tunics. Some mild inflammation was noted in the pyloric mucosal tunics of few mice. Most of the mice had mixed inflammation throughout the lamina propria of the small intestine at all levels, sometimes associated with parasites, including nematodes, cestodes, coccidia, or cryptosporidia. Rare intranuclear inclusions were also seen, most likely viral, and resembled cytomegalovirus inclusions. A few mice also had perivascular cuffing in the fascial planes or smooth muscle of the muscular tunics. Accumulations of flagellates were common in the cecum and colon but were uncommonly associated with inflammation in the lamina propria. Inflammation was uncommon to rare in the mucosa of the rectum or anus. One mouse had a squamous papilloma in the anal mucosa. Three mice had focal glandular herniation into underlying lymphoid nodules, considered a reactive proliferative change associated with parasitism.

Thyroid

Histologic lesions in the thyroids are summarized in Table 3. Only three isolated thyroid lesions were noted in the study. One mouse had unilateral cystic follicular ectasia. One mouse had apparent colloid depletion, and one mouse had bilateral mild follicular epithelial cell hypertrophy. No deposition disorders or neoplasms were noted.

Adrenal

Histologic lesions in the adrenals are summarized in Table 3. Very few adrenal lesions were noted in the study and these included cortical epithelial vacuolar change, mild focal inflammation, and focal hemosiderosis. No neoplasms were noted and aside from the hemosiderosis in one mouse, no deposition disorders were noted.

Liver

Of the 9 livers examined histologically, 8 had moderate to severe inflammation associated with *Capillaria* adult, larval or egg stages. Mild to moderate mixed cell periportal inflammation was noted multifocally in all livers. No foreign bodies or neoplastic processes were noted.

Other Submitted Lesions

There was no lesion in the single spleen that was submitted. Bot fly larval abscesses from the perirectal or perianal region were submitted from 7 mice. The larvae were removed from the lesions prior to sectioning and were not examined histologically. By their nature, abscesses are histologically a relatively

severe lesion and thus were assigned a score of 4. A few of the abscesses had bacteria in them, likely from gut of degenerative bot larvae, or opportunists entering the abscess through the bot breathing hole in the surface of the skin. These lesions likely were not related to any asbestos-mediated lesion.

Opportunistic Ancillary Tissues

A number of opportunistic ancillary tissues were examined histologically and these tissues and any associated lesions are summarized in Appendix 2. Generally, microscopic lesions in these tissues were similar to those seen in the target tissues, and were included in this study because findings in these tissues provide additional support for the proposed pathogenesis of lesions in the target tissues, i.e. parasitism and other infectious events rather than asbestos-related lesions. No deposition disorders or proliferative processes were noted in these tissues.

Discussion

The principal tissue reactions associated with exposure to asbestos occur in the respiratory tract and include peribronchiolar macrophage and multinucleated cell infiltrates, fibroblast activation and collagen deposition resulting in interstitial and pleural fibrosis, bronchial and mesothelial cell hypertrophy and hyperplasia, bronchogenic carcinoma and mesothelioma.^{2,4,11,19,21} Asbestos fibers can be seen histologically in macrophages, multinucleate giant cells and in the alveolar and pleural interstitium.^{5,11,12,19,20,26} Histologic patterns typical of asbestos exposure were not seen in these mice, and no asbestos fibers were seen histologically in any of the mice.

Histologic changes in the respiratory tract were seen in all of the study mice (Table 1); however, the patterns and cellular constituents were not supportive of asbestos exposure. The lesions in these mice were largely attributed to infectious disease. Deer mice are susceptible to numerous parasitic agents that may infect the respiratory tract, including *Capillaria hepaticus*, *Sarcocystis idahoensis*, *Hepatozoon griseisciuri*, *Besnoitia jellisoni*.^{3,7,10,13} At least three separate parasitic agents were identified in the respiratory tract of the study mice (Figures 1, 5, 6, 18). It is likely that the bulk of the inflammatory changes in these mice are due to parasitism. Parasites included *Besnoitia* sp. associated with histiocytic inflammation and granulomas formation, *Sarcocystis* or *Hepatozoon* schizonts associated with perivascular cuffing and hemosiderosis, and nematodes in major or terminal airways. It is likely that the few cases of eosinophilic bronchopneumonia were due to nematodiasis. A Hair embolus contributed to lesion severity in one mouse (Figure 4).

Although bacteria were not seen in the respiratory tract lesions in the H&E stained slides, it is considered likely that bacteria contributed to the inflammatory changes in the study mice. The peribronchiolar cuffing and lymphonodular hyperplasia are characteristic lesions associated with exposure to *Mycoplasma pulmonis*, often in conjunction with other bacteria such as *Corynebacterium kutscheri*, *Pasteurella* spp. and cilia-associated respiratory bacilli²⁴ (Figures 19-30). Additionally, intranuclear inclusions resembling cytomegalovirus, adenovirus or possibly polyomavirus inclusions were seen in a few of the mice, and these may have contributed to inflammatory changes as well.¹

Pleural lesions were seen in few of the mice, including inflammation, lymphonodular hyperplasia, some mild focal fibrosis or adhesions, and mild focal mesothelial cell hypertrophy in one mouse. These lesions were attributed to parasitism. Some of the pleural nodules may have been residual thymic nodules rather than true foci of antigenic stimulation (Figure 28). It is considered unlikely that the fibrosis was due to asbestosis, since the inflammatory changes were similar to those seen in other tissues. Pleural fibrosis due to asbestos exposure is accompanied by interstitial fibrosis (asbestosis),^{4,5} and no interstitial fibrosis was noted. Also, no asbestos fibers were noted histologically in the pleural lesions.

Hemosiderosis is a change that can be seen concurrently with asbestosis,⁹ and a few mice had small foci of hemosiderosis in the lungs; however, these foci were associated with perivascular cuffing and endothelial parasitism, and for reasons previously stated it is likely that the hemosiderosis was due to vascular damage associated with parasitism and inflammation rather than asbestos exposure.

Alimentary tract lesions (Table 2) were primarily inflammatory, mild and mostly confined to the small intestine (Figures 11-17). With the exception of a few foreign body granulomas (Figures 11-12), all inflammatory changes were attributed to expected forms of parasitism, including coccidiosis, cryptosporidiosis, nematodiasis and cestodiasis.^{1,13,27} A single mouse had intranuclear inclusions in mucosal epithelial cells resembling cytomegalovirus inclusions, and this agent may also have contributed to some of the inflammation. Bacteria, yeasts and flagellated protozoa were also seen primarily in the large intestine, and likely were incidental findings. A single squamous papilloma was noted in the anus of one mouse (Figure 2). This lesion may have been induced by trauma, papillomavirus or herpesvirus infection. The adenomatous polyps described in rodents experimentally exposed to oral asbestos were not seen in this study.¹⁵⁻¹⁸

Thyroid lesions in these mice (Table 3) included mild cystic ectasia and mild colloid depletion in one mouse (Figure 3), and mild diffuse follicular epithelial cell hypertrophy noted in one mouse. These findings were considered incidental and may have been age related, or due to illness associated with other disease processes. The C cell hyperplasia and adenomas associated with experimental exposure to asbestos in rats were not seen in the study mice.^{15,17}

Adrenal lesions in these mice (Table 3) were uncommon and included inflammation, hemosiderosis and vacuolar change in cortical epithelium (Figures 9-10). The inflammation and hemosiderosis were likely due to parasite migration as previously noted. Vacuolar change is common in the adrenal cortex of mammals, and can be due to lipidosis or stress. No neoplastic processes were seen in the adrenal, including the adenomas reported in hamsters exposed orally to asbestos.¹⁵

Two primary hepatic lesions were noted in the few livers submitted that were examined histologically (Appendix 1). Capillariasis due to *C. hepatica* was fulminate in 8 of the 9 livers (Figures 7-8).¹³ In spite of the severity and chronicity of the lesions, it is possible that the condition was well tolerated in the affected mice, since they appeared to be in good nutritional status. The portal tract in all examined livers had mild infiltrates of lymphocytes and plasma cells. This is a common lesion associated with ascending inflammatory processes of the biliary tree, and likely also was due to parasitism. No toxic or neoplastic lesions were seen in the examined livers.

As previously noted, bot fly larval abscesses from the perirectal or perianal region were submitted from 7 mice (Appendix 1). The larvae were removed from the lesions prior to sectioning and were not examined histologically. By their nature, abscesses are histologically a relatively severe lesion and thus were assigned a score of 4. A few of the abscesses had bacteria in them, likely from gut of degenerative bot larvae, or opportunists entering the abscess through the bot breathing hole in the surface of the skin. These lesions likely were not related to any asbestos-mediated lesion.

Several tissues were examined opportunistically during the study, and these are listed in Appendix 2. In small animals such as mice, it can be difficult to isolate a single tissue macroscopically and it is common to harvest adjacent tissue as well; these adjacent tissues are referred to as opportunistic. For instance, it was common to have pancreas on the same slide as small intestine, or salivary gland on the same slide as thyroid. Lesions in these opportunistic tissues mirrored those seen in the target tissues, and provided no further information that would indicate exposure to asbestos in the study mice.

Table 1. A summary of the percentage of histologic lesions occurring in the respiratory tract of deer mice (*Peromyscus maniculatus*) from the Libby Superfund and Reference Sites.

Lesion	Larynx 71	Trachea 72	Left Mainstem Bronchus 66	Left Cranial Lung 70	Left Middle Lung 70	Left Caudal Lung 70	Right Mainstem Bronchus 62	Right Cranial Lung 72	Right Middle Lung 72	Right Caudal Lung 72	Post Caval Lung 70
No lesion	32 (45%)	18 (25%)	17 (26%)	16 (23%)	20 (29%)	9 (13%)	20 (32%)	10 (14%)	14 (19%)	4 (6%)	10 (14%)
Lesion	39 (55%)	54 (75%)	49 (74%)	54 (77%)	50 (71%)	61 (87%)	42 (68%)	62 (86%)	58 (81%)	68 (94%)	60 (86%)
Mucosal hyperplasia	1 (1%)										
Inflammation	38 (54%)	54 (75%)	27 (41%)	46 (66%)	44 (63%)	57 (81%)	27 (44%)	61 (85%)	50 (69%)	59 (82%)	57 (81%)
Perivascular cuffing				44 (63%)	43 (61%)	53 (76%)		56 (78%)	47 (65%)	55 (76%)	53 (76%)
Peribronchiolar cuffing				31 (44%)	36 (51%)	40 (57%)		41 (57%)	47 (65%)	55 (76%)	51 (73%)
Lymphonodular Hyperplasia	2 (3%)	3 (4%)	25 (38%)	21 (30%)	16 (23%)	12 (17%)	20 (32%)	13 (18%)	24 (33%)	42 (58%)	33 (47%)
Interstitial pneumonia				5 (7%)	9 (13%)	12 (17%)		9 (12%)	6 (8%)	13 (18%)	12 (17%)
Bronchopneumonia						1 (1%)		1 (1%)			1 (1%)
Granuloma		1 (1%)		2 (3%)						1 (1%)	2 (3%)
Parasitodes	1 (1%)					2 (3%)				1 (1%)	1 (1%)
Protozoa				1 (1%)	2 (3%)			2 (3%)	2 (3%)	3 (4%)	1 (1%)
Inclusions				1 (1%)	2 (3%)	1 (1%)		2 (3%)	3 (4%)		
Foreign bodies										2 (3%)	
Hemosiderin		1 (1%)		2 (3%)	1 (1%)	5 (7%)		3 (4%)	3 (4%)	5 (7%)	2 (3%)
Syncytia						2 (3%)		2 (3%)	1 (1%)	1 (1%)	2 (3%)
Pleural inflammation								1 (1%)	1 (1%)	1 (1%)	1 (1%)
Pleural lymphonodular hyperplasia				3 (4%)	2 (3%)	3 (4%)		2 (3%)	2 (3%)	13 (18%)	9 (13%)
Pleural fibrosis						1 (1%)				2 (3%)	3 (4%)
Pleural mesothelial hypertrophy										1 (1%)	

Table 2. A summary of the percentage of histologic lesions occurring in the alimentary tract of deer mice (*Peromyscus maniculatus*) from the Libby Superfund and Reference Sites.

Lesion	Esophagus N=72	Cardiac Stomach N=72	Fundus N=72	Pylorus N=71	Duodenum N=72	Jejunum N=72	Ileum N=72	Cecum N=72	Colon N=72	Rectum N=72	Anus N=54
Lesion	5 (7%)	11 (15%)	3 (4%)	9 (13%)	61 (85%)	63 (88%)	67 (93%)	55 (76%)	38 (53%)	4 (6%)	3 (6%)
No lesion	67 (93%)	61 (85%)	69 (96%)	62 (87%)	11 (15%)	9 (12%)	5 (7%)	17 (24%)	34 (47%)	68 (94%)	51 (94%)
Inflammation	4 (6%)	11 (15%)	3 (4%)	9 (13%)	61 (85%)	63 (88%)	67 (93%)	2 (3%)	3 (4%)	3 (4%)	2 (4%)
Lymphonodular hyperplasia	1 (1%)										
Granuloma		3 (4%)									
Foreign body		3 (4%)									
Nematode		1 (1%)					1 (1%)	9 (12%)			
Cestode						9 (12%)	1 (1%)				
Coccidia						5 (7%)	5 (7%)	5 (7%)	5 (7%)		
Cryptosporidia								1 (1%)	1 (1%)		
Flagellates							3 (4%)	45 (62%)	34 (47%)	1 (1%)	
Yeast								2 (3%)	2 (3%)		
Inclusions									1 (1%)		
Proliferative lesion		1 (1%)			1 (1%)		1 (1%)	1 (1%)			1 (1%)

Table 3. A summary of the percentage of histologic lesions occurring in the thyroids and adrenals of deer mice (*Peromyscus maniculatus*) from the Libby Superfund and Reference Sites.

Lesion	Thyroid N=68	Adrenal N=72
Lesion	3 (4%)	11 (15%)
No lesion	65 (96%)	61 (85%)
Follicular cystic ectasia	1 (1%)	
Follicular epithelial cell hypertrophy	1 (1%)	
Colloid depletion	3 (4%)	
Vacuolar change		6 (8%)
Inflammation		5(7%)
Hemosiderin		1 (1%)

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Figure 1. Lung, R-A-3-1. Note intracytoplasmic schizont in endothelial cell or macrophage (arrow). Also mild perivascular inflammatory cell cuffing (arrowheads) and euthanasia-associated hemorrhage (h). HE.

Figure 2. Anus, R-A-32-1. Note squamous papilloma with associated hyperkeratosis (h). HE.

Figure 3. Thyroid, R-A-32-1. Note variably ecstatic thyroid follicles with reduced colloid content (c). HE.

Figure 4. Lung, R-A-57-2. Note hair embolus (large black arrow), partially organized thrombus (arrowhead), perivascular lymphoid nodule (small black arrow) and moderate perivascular cuffing (white arrows). HE

Figure 5. Lung, S-F-1-1. Note *Capillaria* egg embolus (large black arrow), with partial, organized thrombus (white arrow), mild perivascular lymphoid cuffing (small black arrow), and mild peribronchiolar cuffing (white arrow). HE.

Figure 6. Lung, S-F-1-1. Higher magnification of Figure 5 showing characteristic barrel shaped, bi-operculated eggs of *Capillaria* sp. HE.

Figure 7. Liver, S-F-3-1. Note numerous clusters of *Capillaria* eggs (arrows) in the hepatic parenchyma embedded in inflamed fibrous matrix (f), with only few residual hepatocytes (arrowheads). HE

Figure 8. Liver, S-F-3-1. Higher magnification of Figure 7. Note typical barrel-shaped, bi-operculated eggs of *Capillaria* sp. HE.

Figure 9. Adrenal, S-A-19-1. Note zona glomerulosa (g), zona fasciculata (f), zona reticularis (r) and medulla (m). Note diffuse mild vacuolar change in the zona fasciculata. HE.

Figure 10. Adrenal, S-A-19-1. Higher magnification of Figure 9 showing intracytoplasmic vacuolar change in the epithelial cells of the zona fasciculata. HE.

Figure 11. Stomach, S-A-4-2. Note focal hyperplasia (h) of cardiac (c) mucosa associated with a foreign body granuloma (arrow). Fundic region (f) is histologically within normal limits. HE

Figure 12. Stomach, S-A-4-2. Higher magnification of hyperplastic focus in Figure 11, showing hair shaft (arrow) within the granuloma at the center of the hyperplastic mucosa. HE

Figure 13. Cecum, S-A-4-2. Note flagellated protozoa in the central lumen and along the mucosal surface. HE.

Figure 14. Cecum, S-D-7-1. Note transverse sections of nematodes in the central lumen. HE.

Figure 15. Colon, R-C-10-1. Note yeast forms (arrows) in luminal fecal material. HE.

Figure 16. Jejunum, R-A-19-1. Note thickening of the villi (arrows) due to inflammatory infiltrates associated with coccidiosis. HE.

Figure 17. Jejunum, R-A-19-1. Higher magnification of coccidiosis. Note mild lymphoplasmacytic inflammation in the lamina propria (long arrow) associated with mucosal epithelial intracytoplasmic macrogamete (short arrow) and oocysts (arrowheads). HE.

Figure 18. Lung, S-A-11-1. Typical pulmonary *Besnoitia* cyst. HE.

Figure 19. Lung, S-A-11-1. Mild multifocal interstitial pneumonia. HE.

Figure 20. Larynx, S-D-1-1. Mild multifocal submucosal inflammation (arrows). HE.

Fig 21. Larynx, S-D-1-1. Higher magnification of Figure 20 showing focal mild lymphoplasmacytic, neutrophilic and eosinophilic submucosal inflammation (arrow). HE.

Figure 22. Lung, S-A-11-1. Mild peribronchiolar inflammatory cell cuffing (arrowheads) and focal mild lymphonodular hyperplasia (arrow). HE.

Figure 23. Lung, R-A-62-1. Moderate multifocal peribronchiolar lymphonodular hyperplasia (arrows). HE.

Figure 24. Lung, R-A-62-1. Higher magnification of Figure 23 showing lymphocyte population. HE.

Figure 25. Lung, R-A-19-1. Focal mild subpleural lymphoid nodule. HE.

Figure 26. Lung, R-A-62-1. Focal mild lymphoplasmacytic interstitial pneumonia (arrow) and a small focus of hemosiderosis (arrowhead). HE.

Figure 27. Lung, R-D-3-1. Moderate perivascular lymphoid cuff (arrow). HE.

Figure 28. Lung, R-A-48-1. Pleural lymphoid nodule with eosinophilic bodies resembling nerve ganglion or thymic corpuscle. The yellow material around the nodule is tissue ink. HE.

Figure 29. Trachea, R-C-20-2. Note mild submucosal edema (e) and mixed inflammation. HE.

Figure 30. Trachea, R-C-20-2. Note mild focal submucosal lymphonodular hyperplasia. HE.

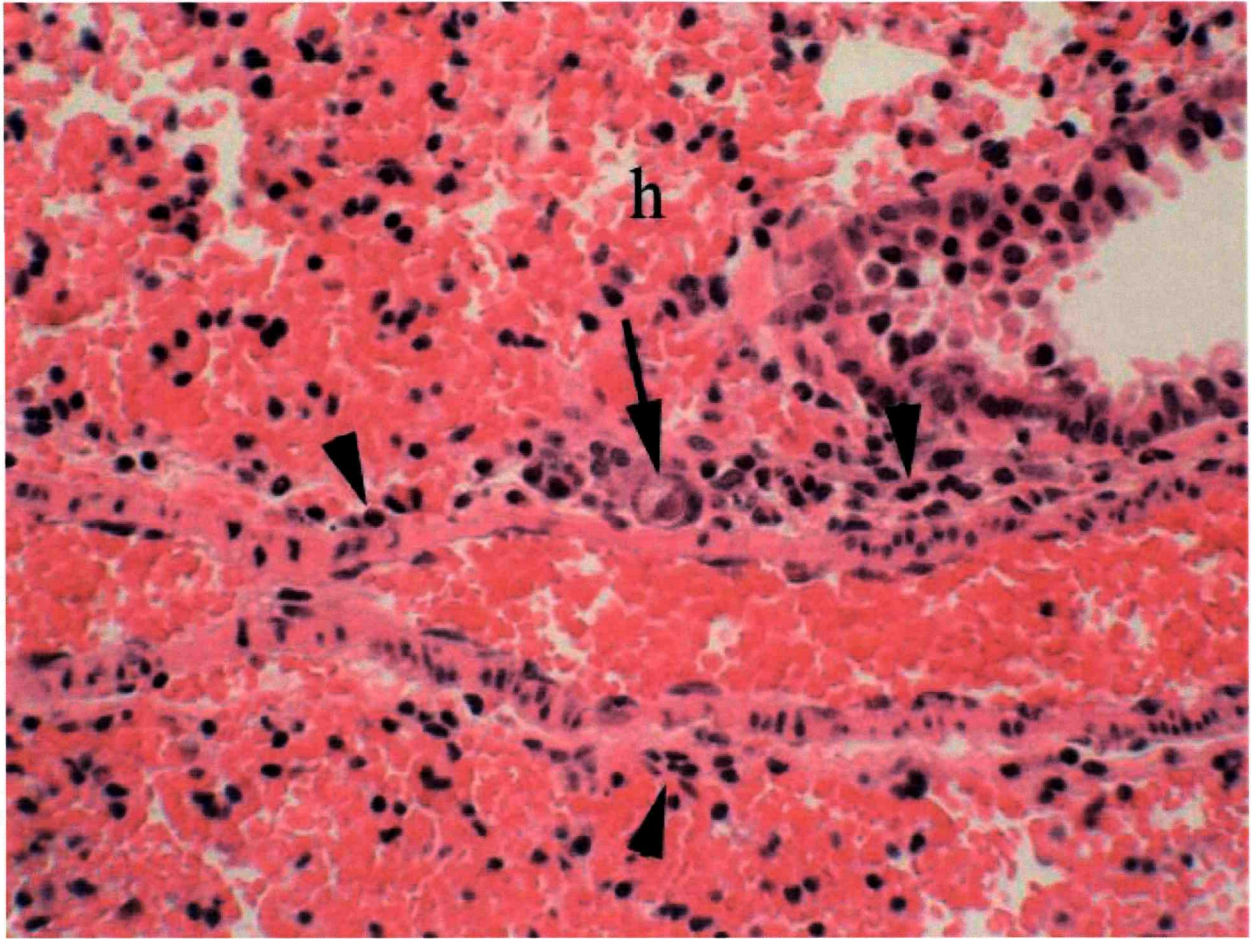


Figure 1



Figure 2

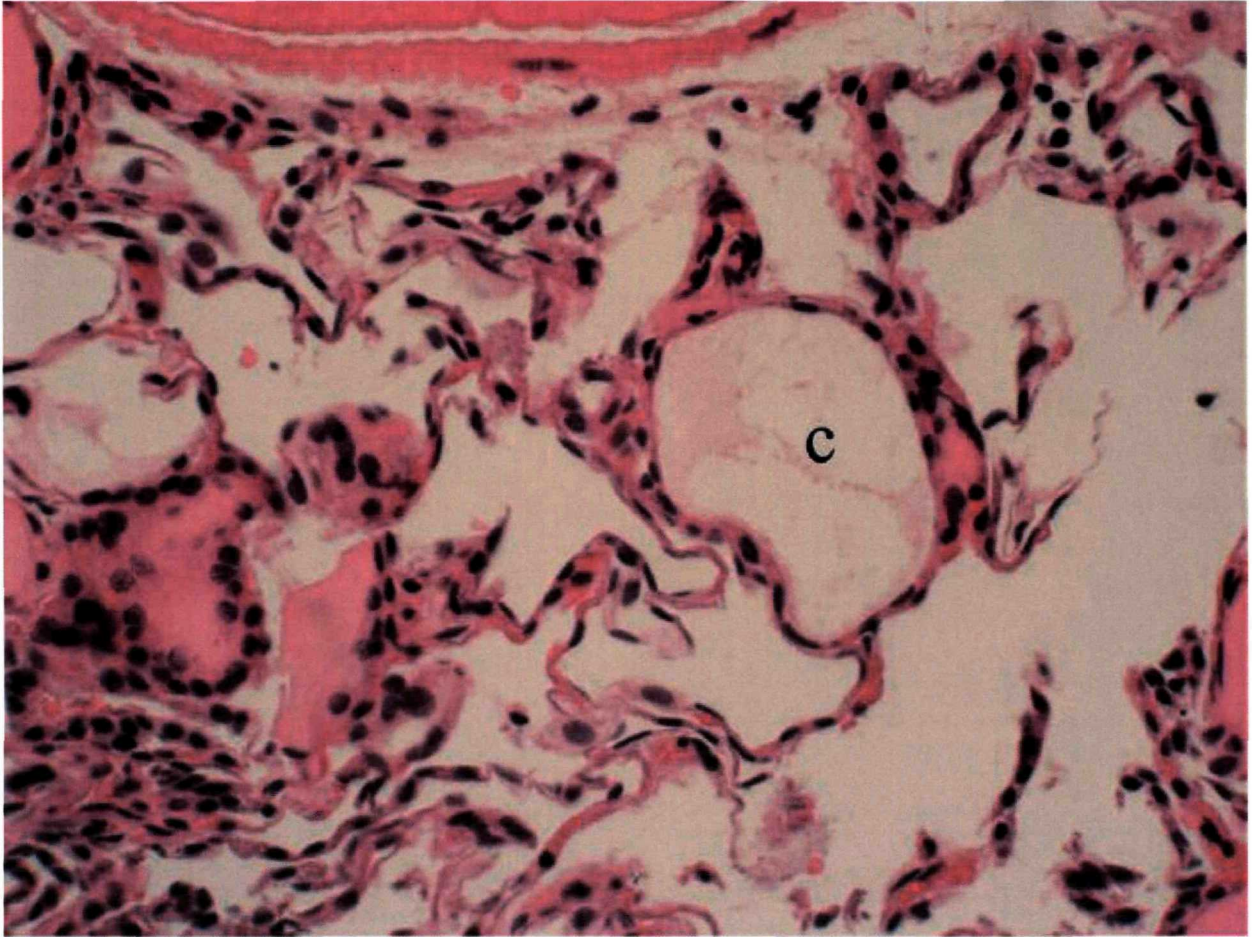


Figure 3

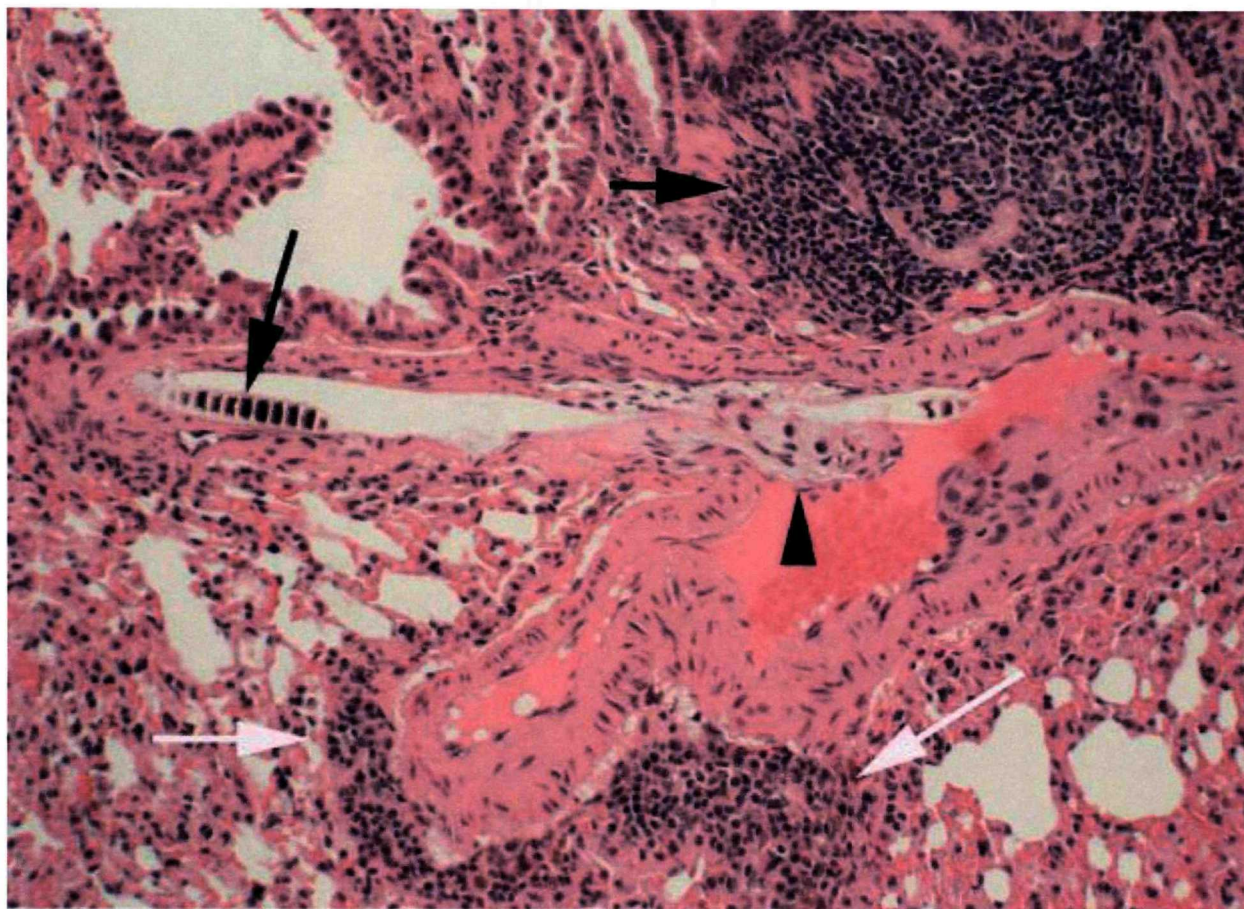


Figure 4

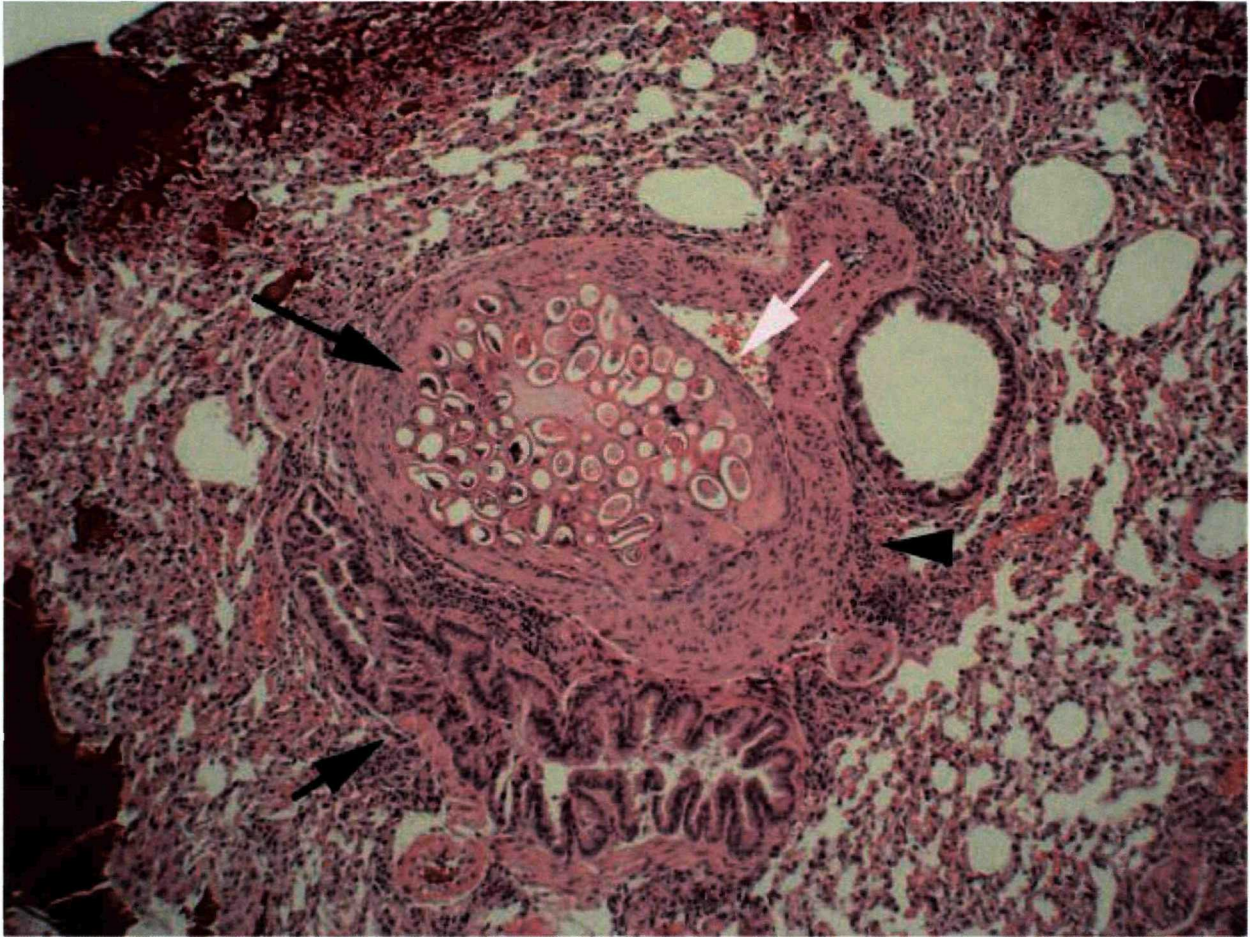


Figure 5

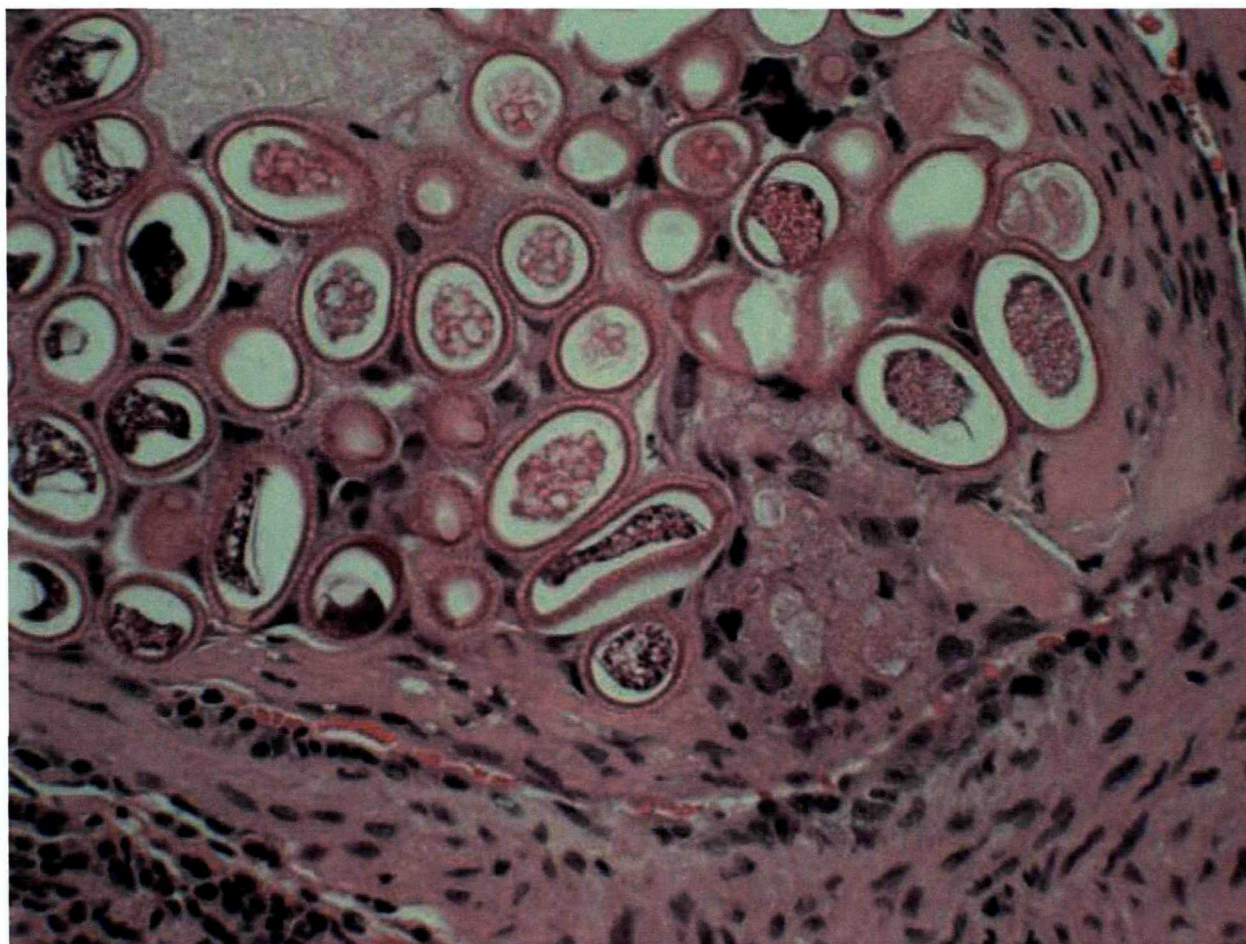


Figure 6

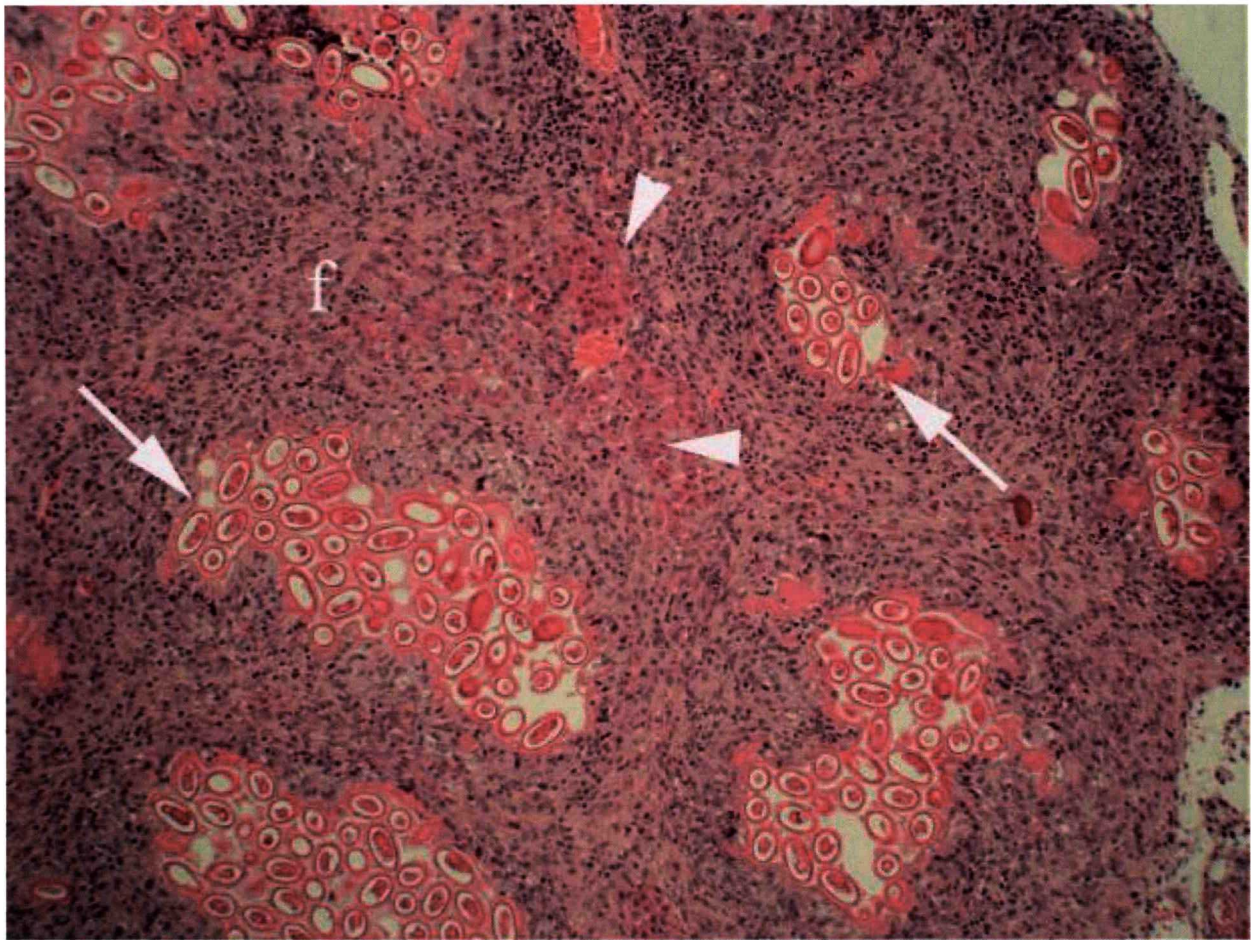


Figure 7

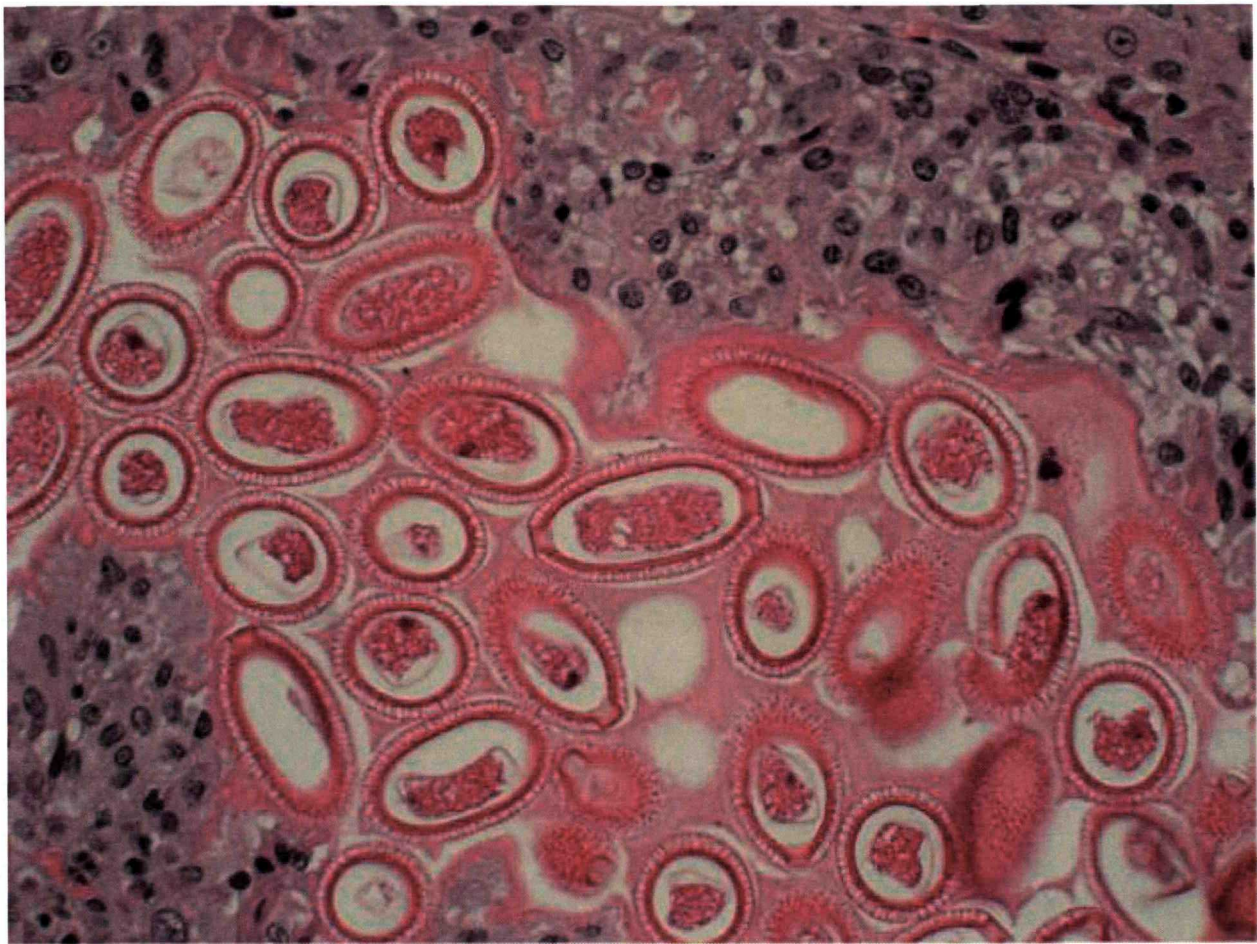


Figure 8

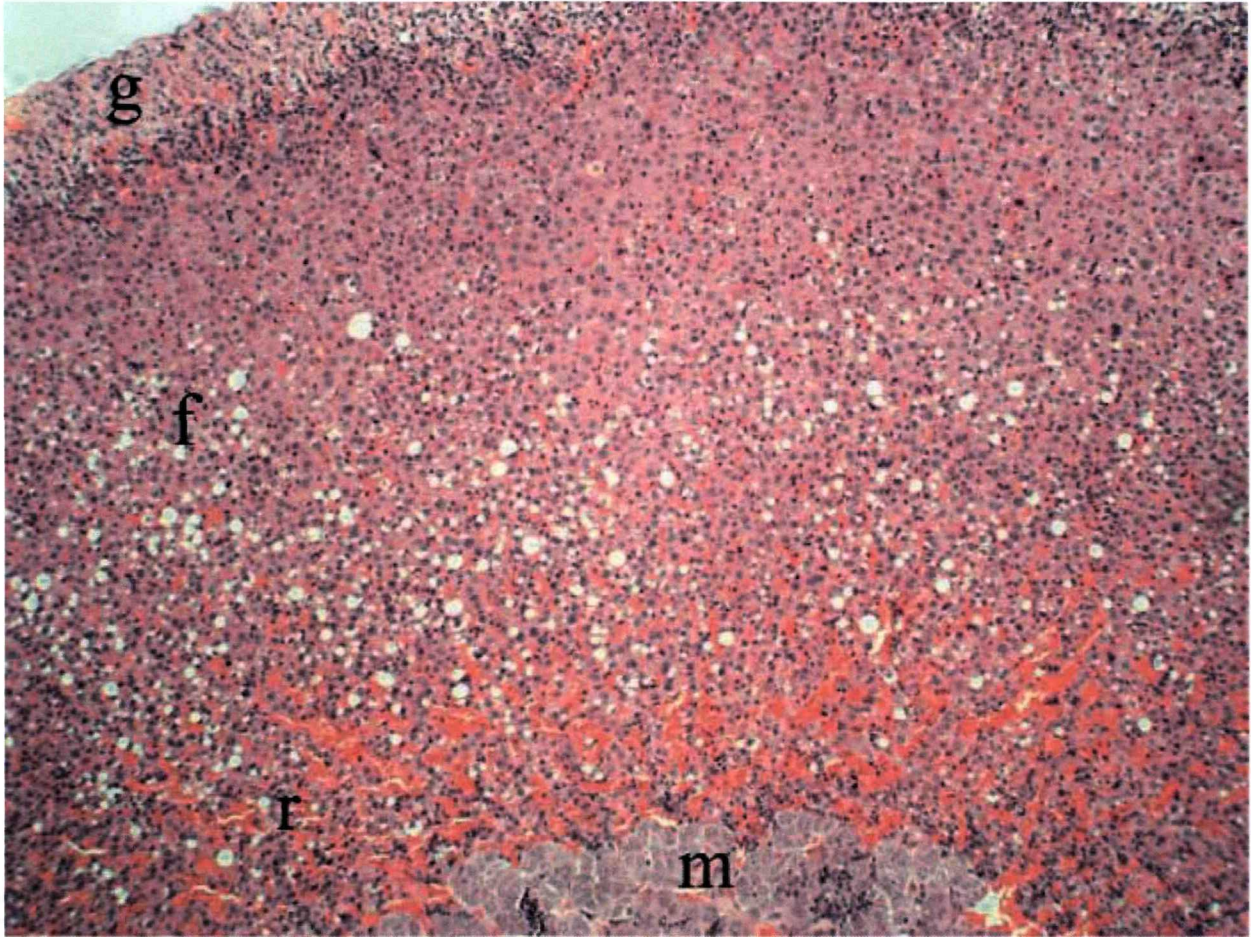


Figure 9

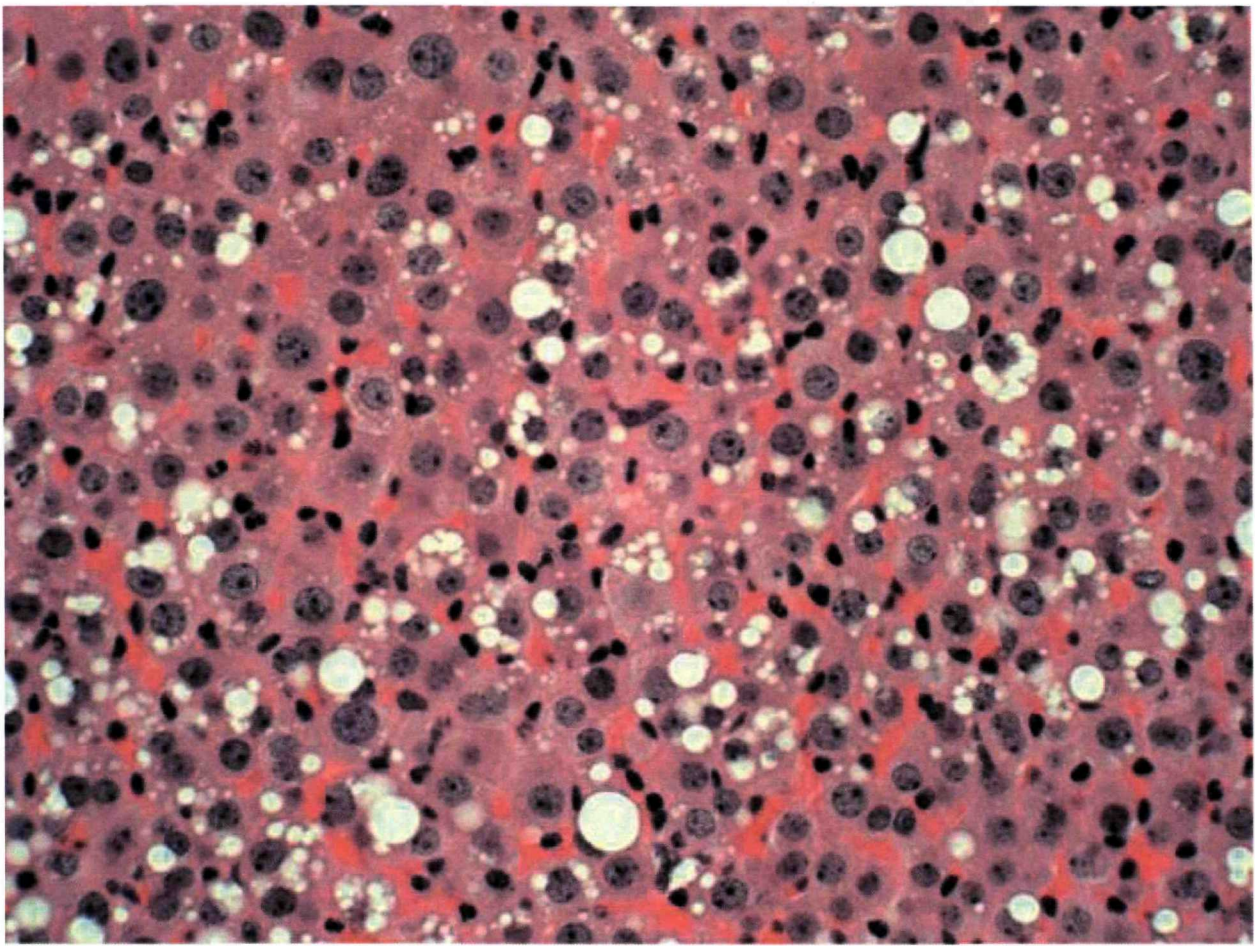


Figure 10

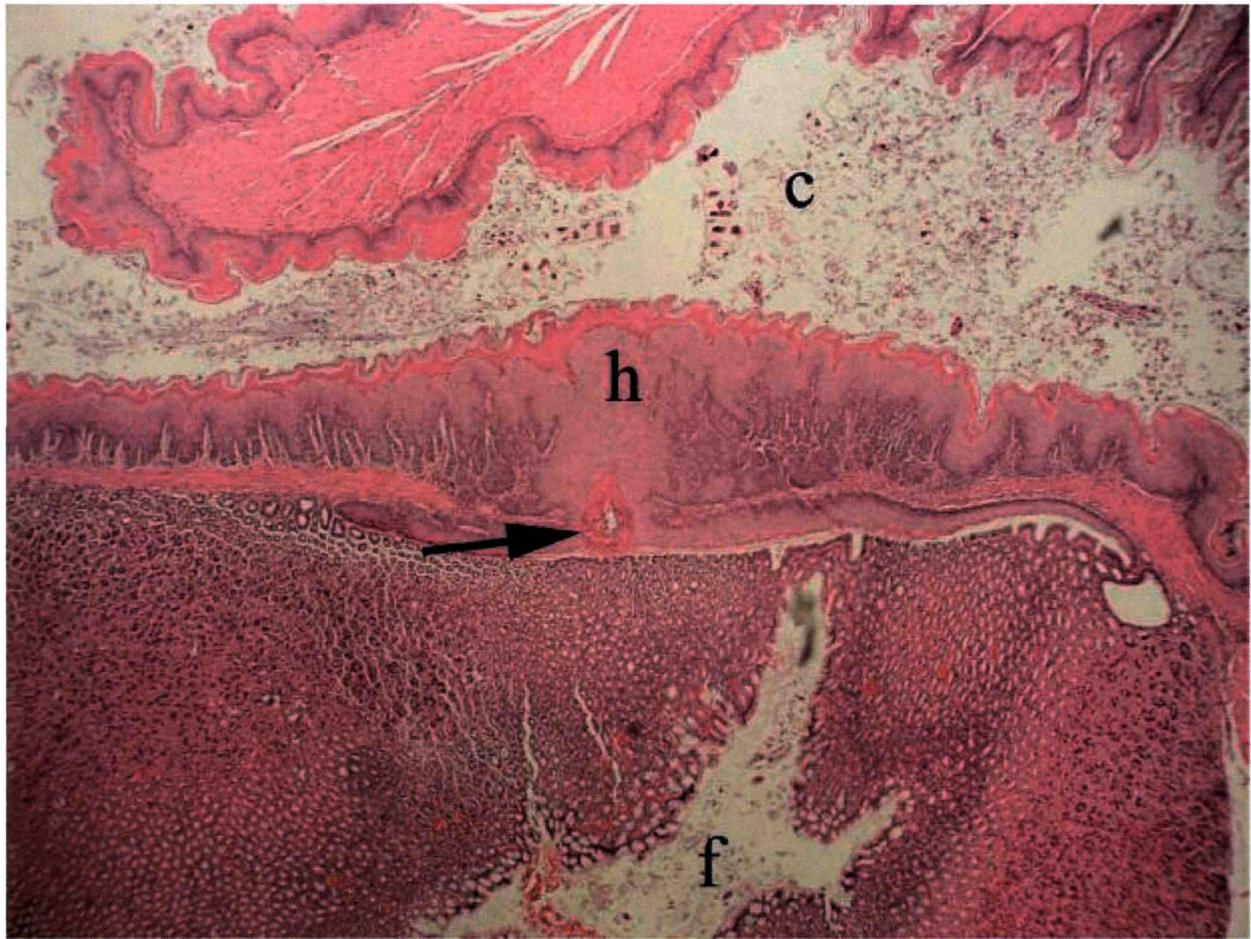


Figure 11

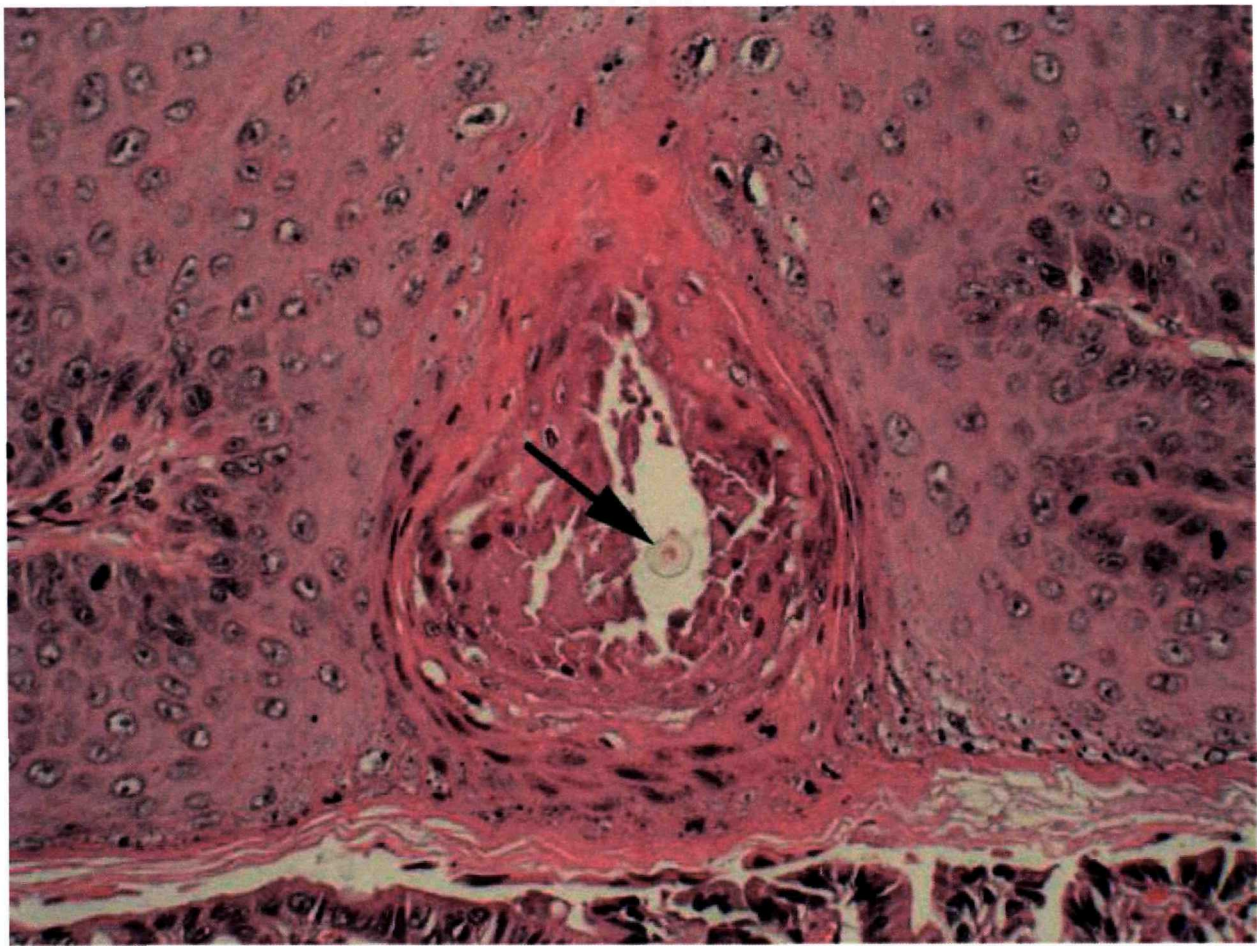


Figure 12

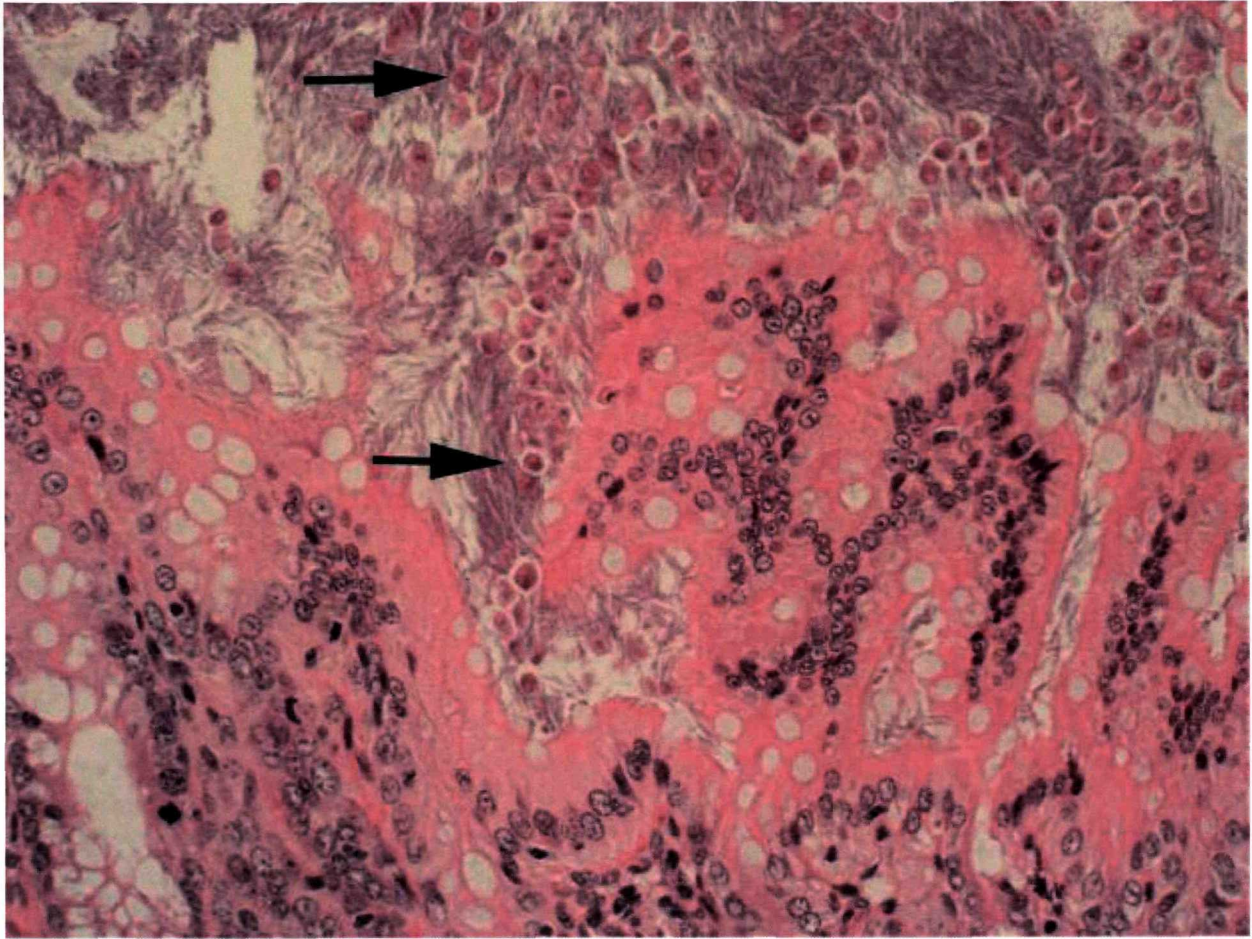


Figure 13



Figure 14

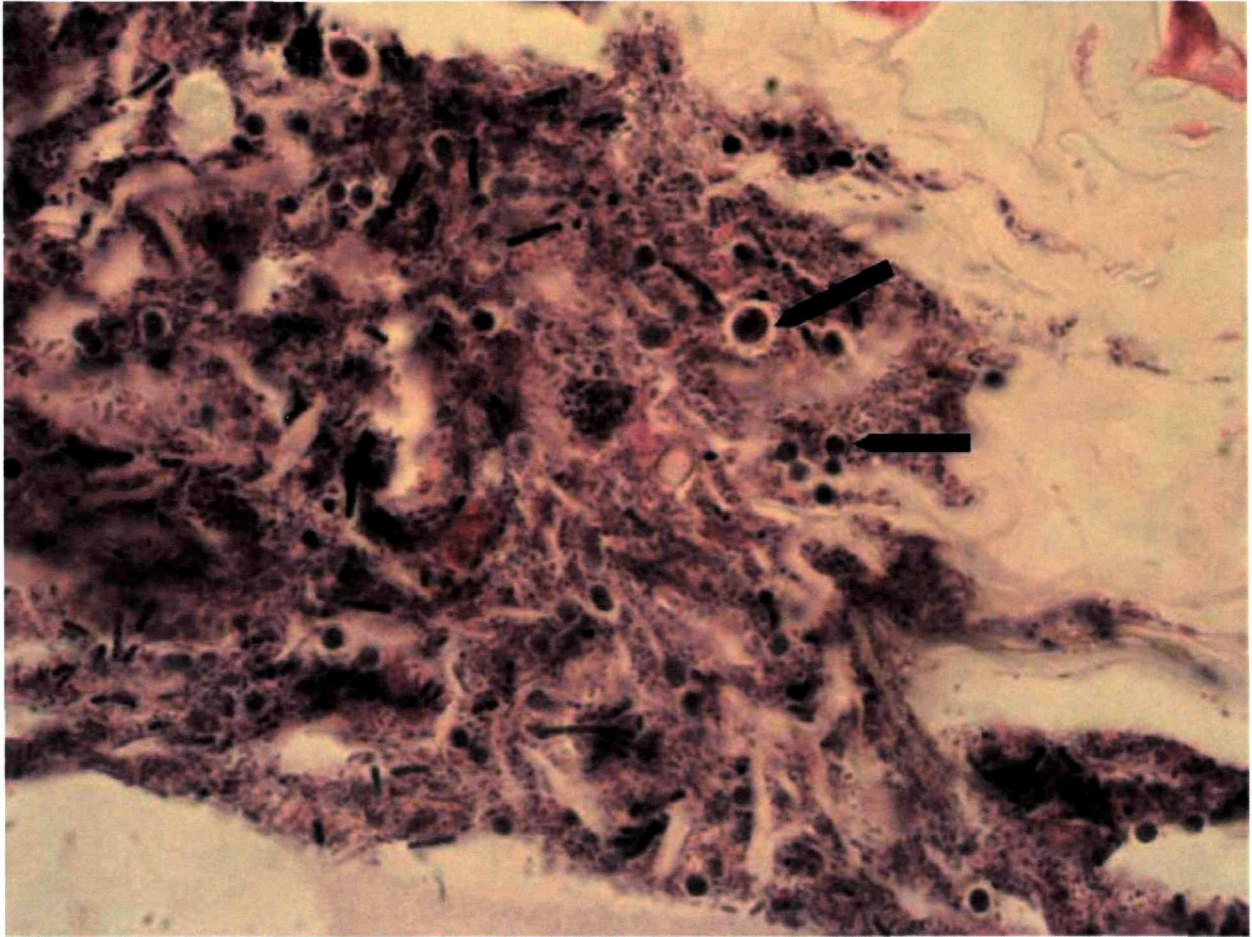


Figure 15

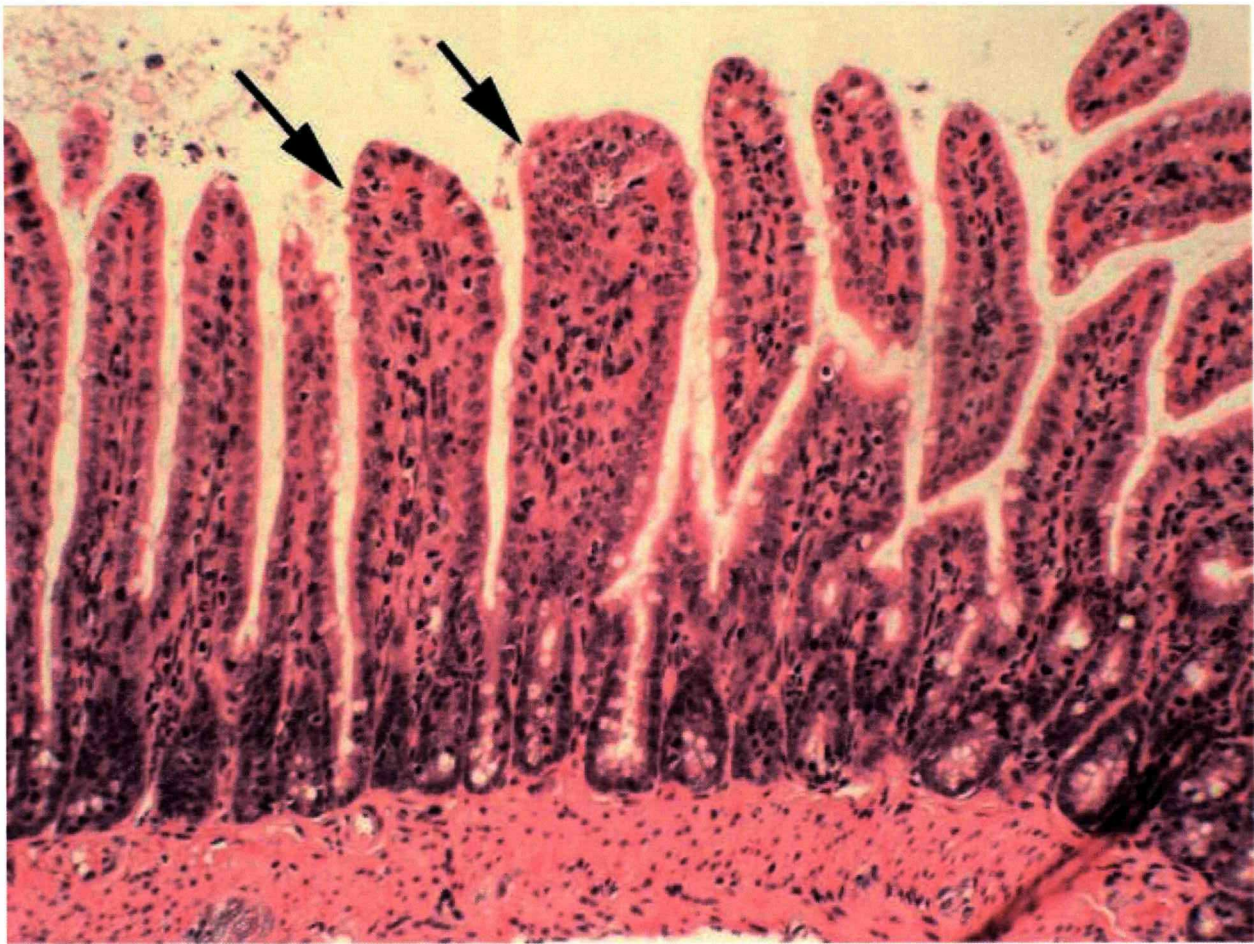


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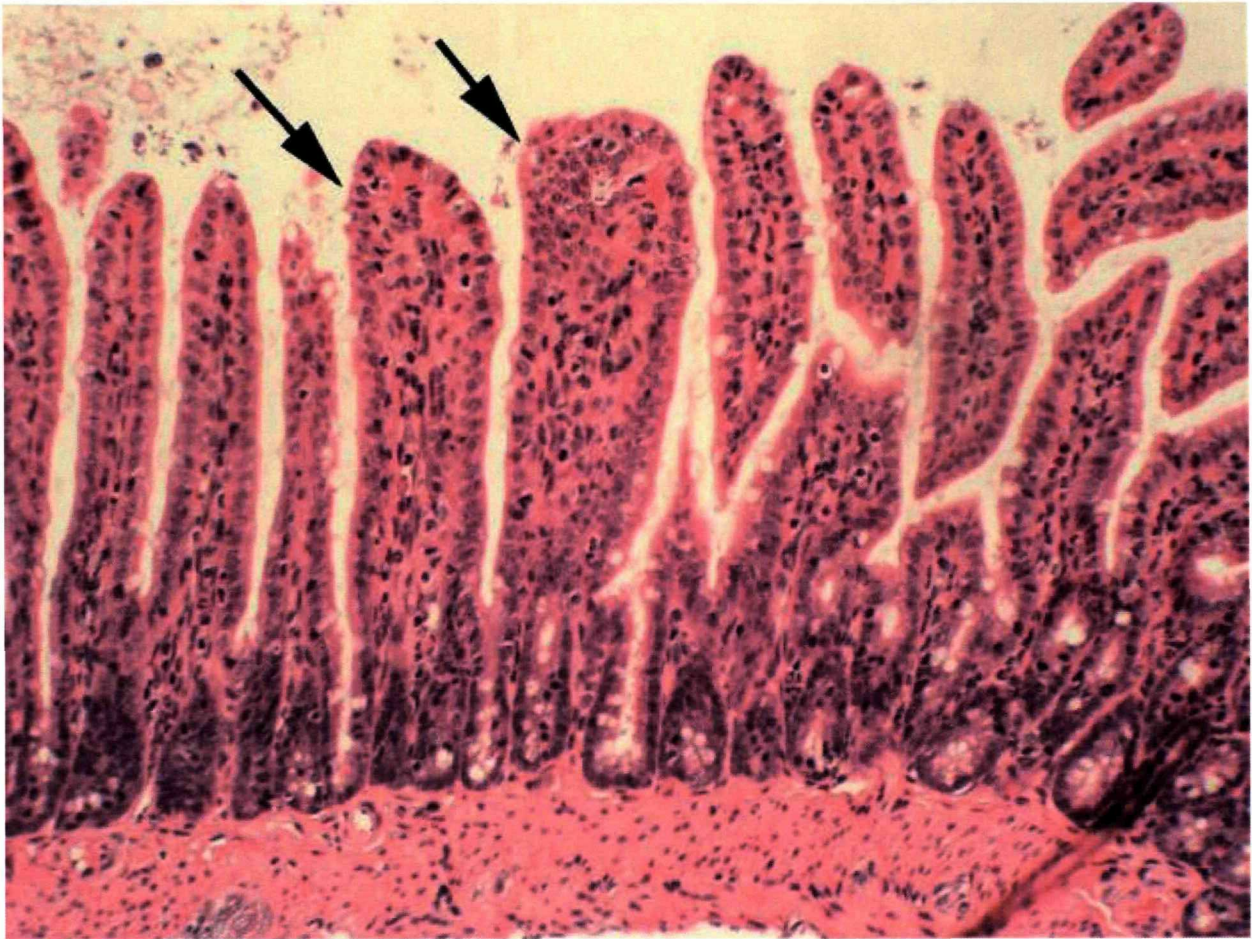


Figure 17

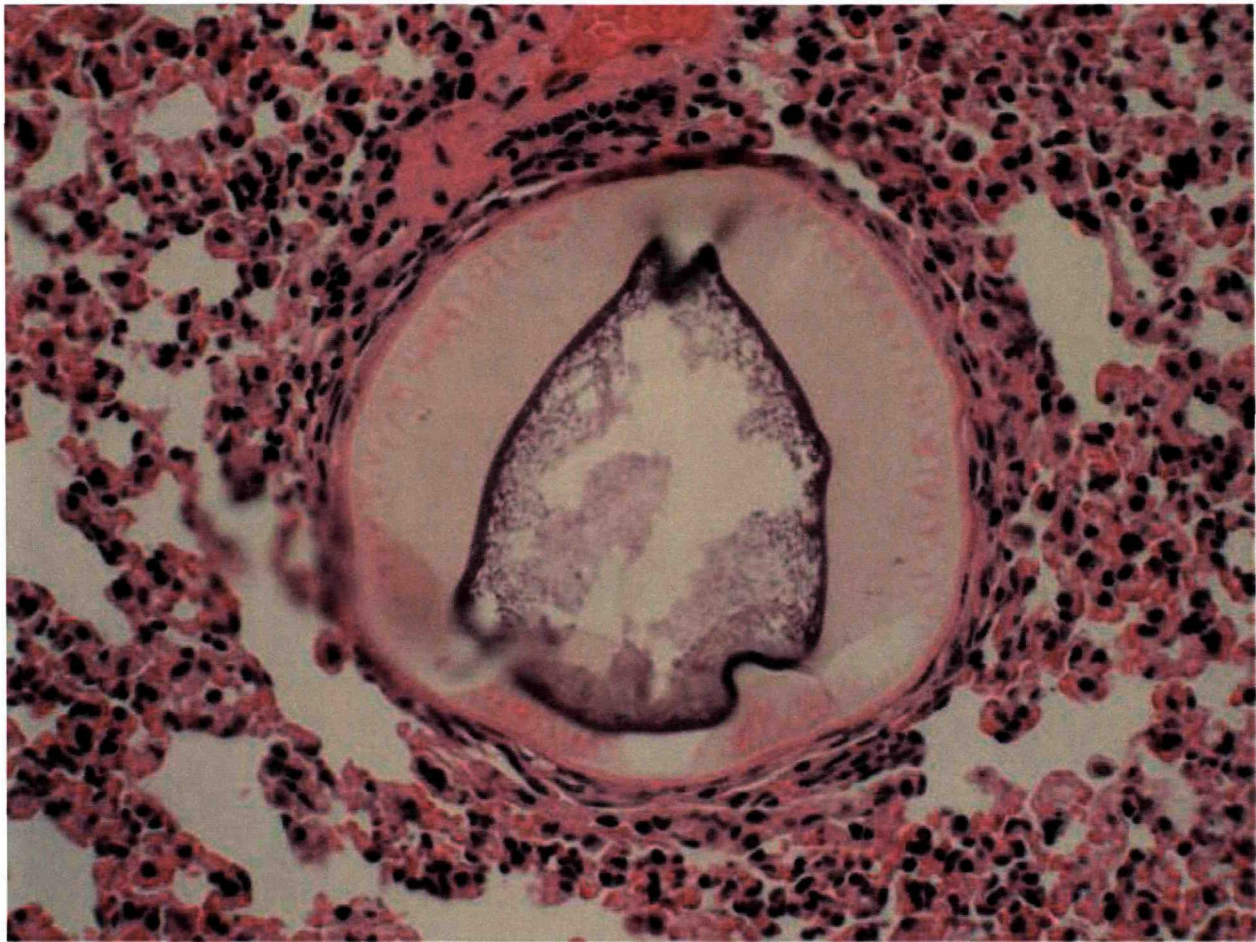


Figure 18

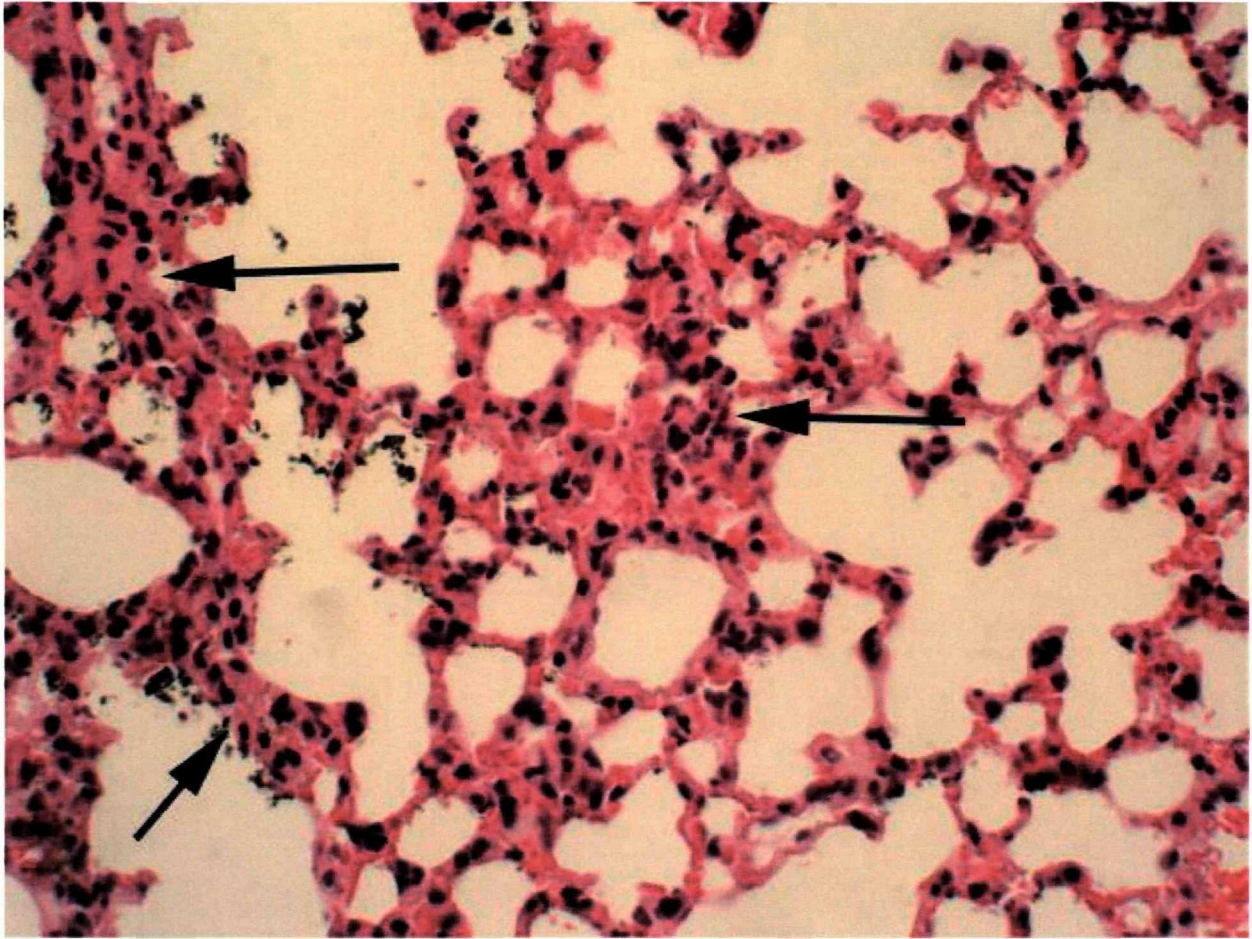


Figure 19

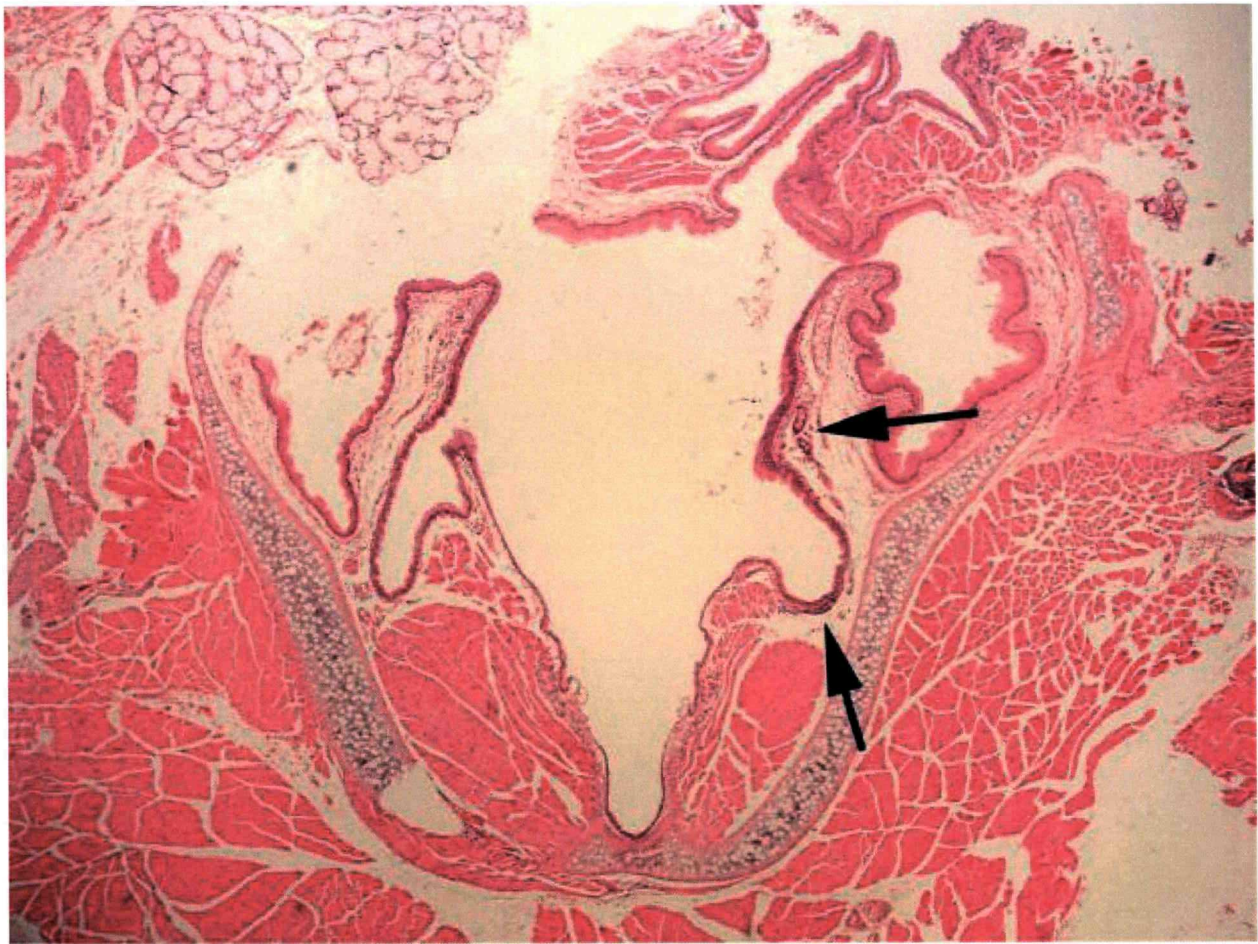


Figure 20



Figure 21

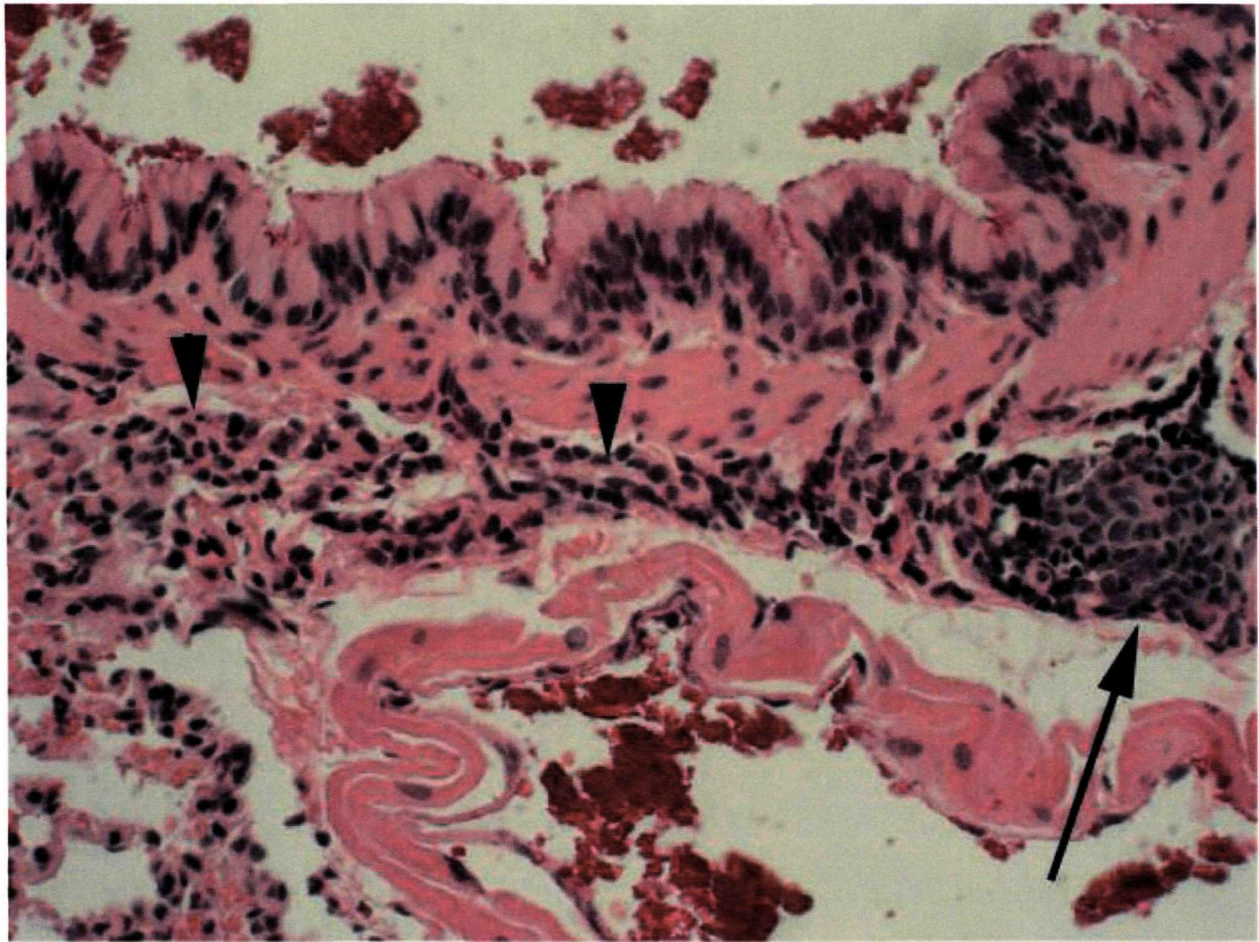


Figure 22

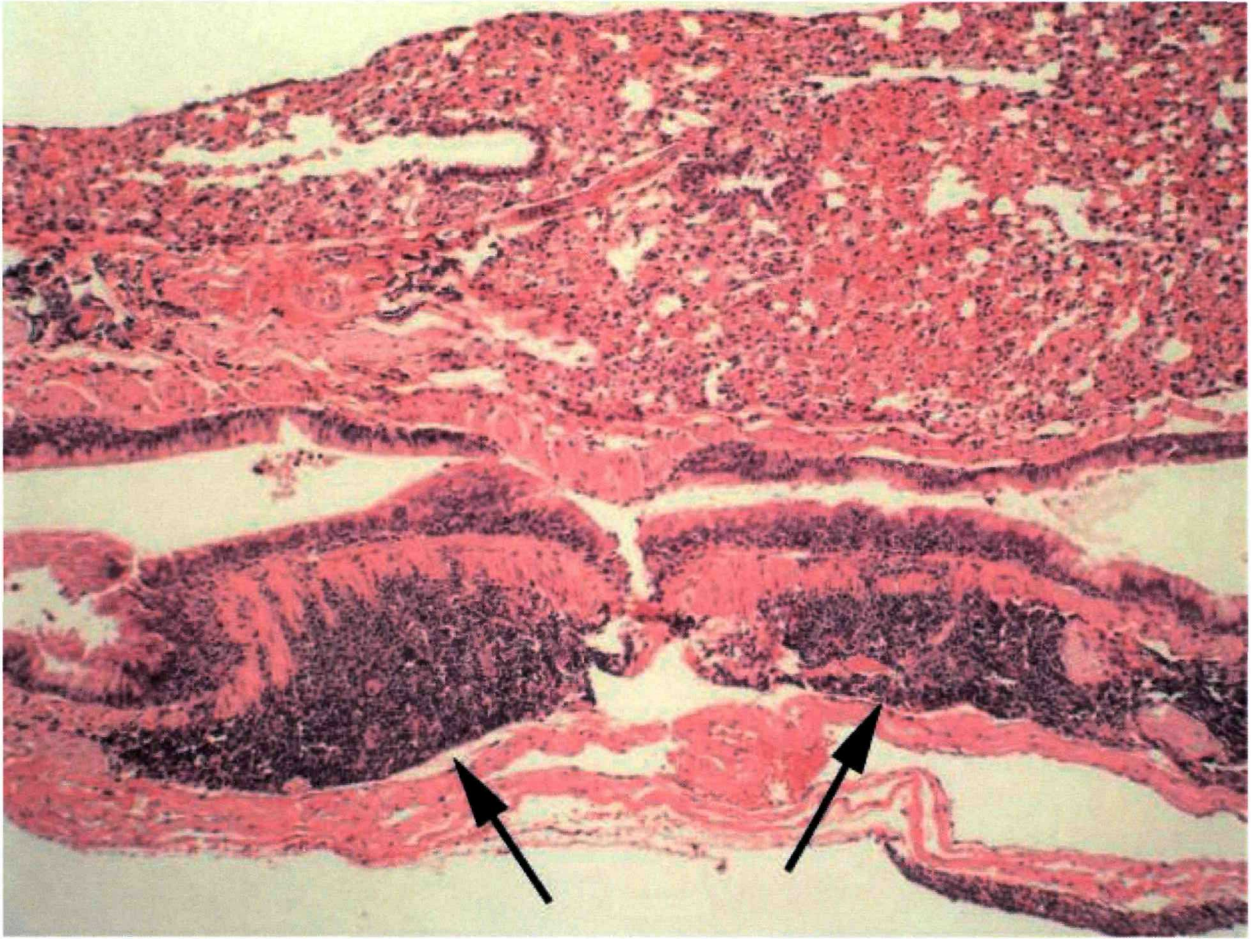


Figure 23

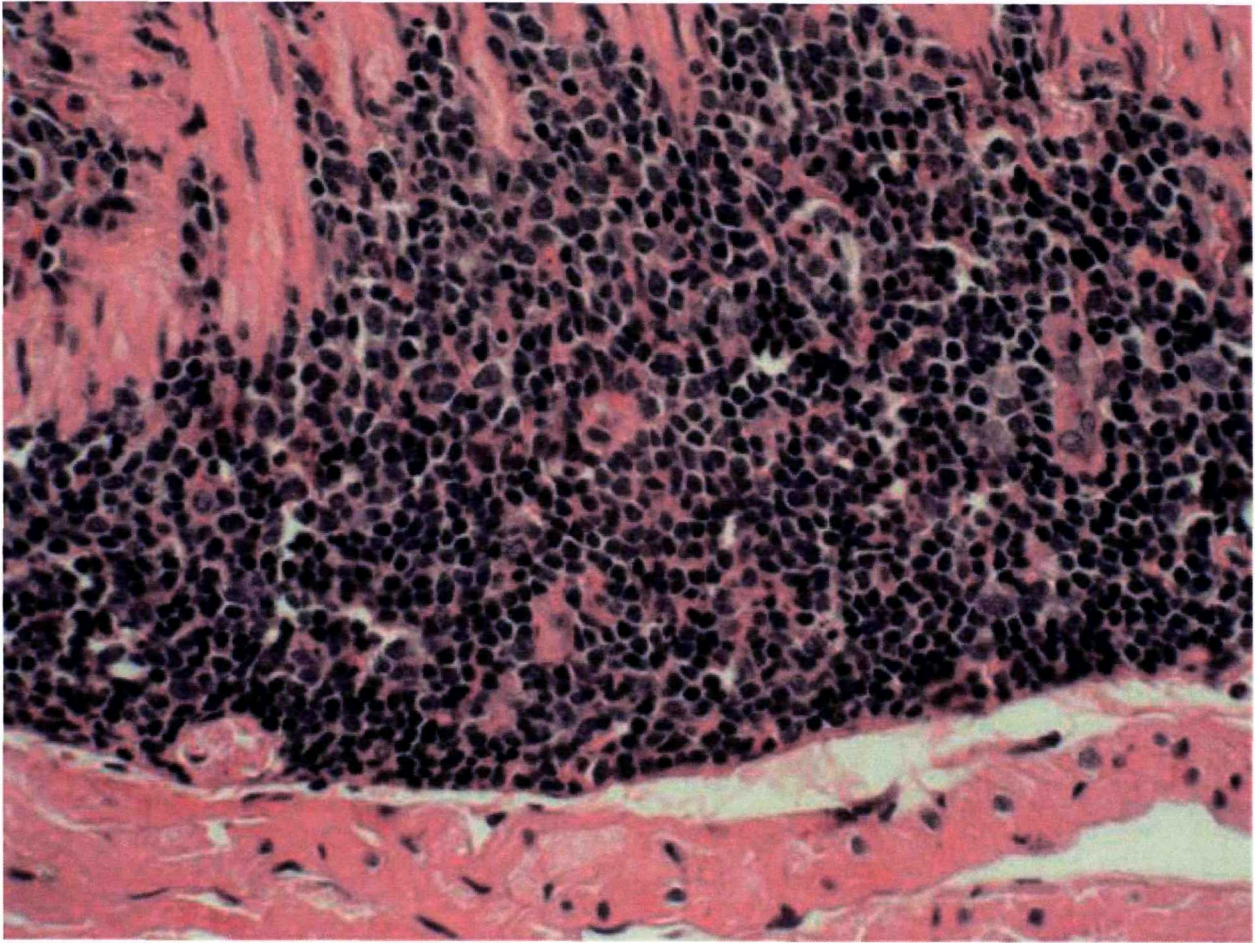


Figure 24

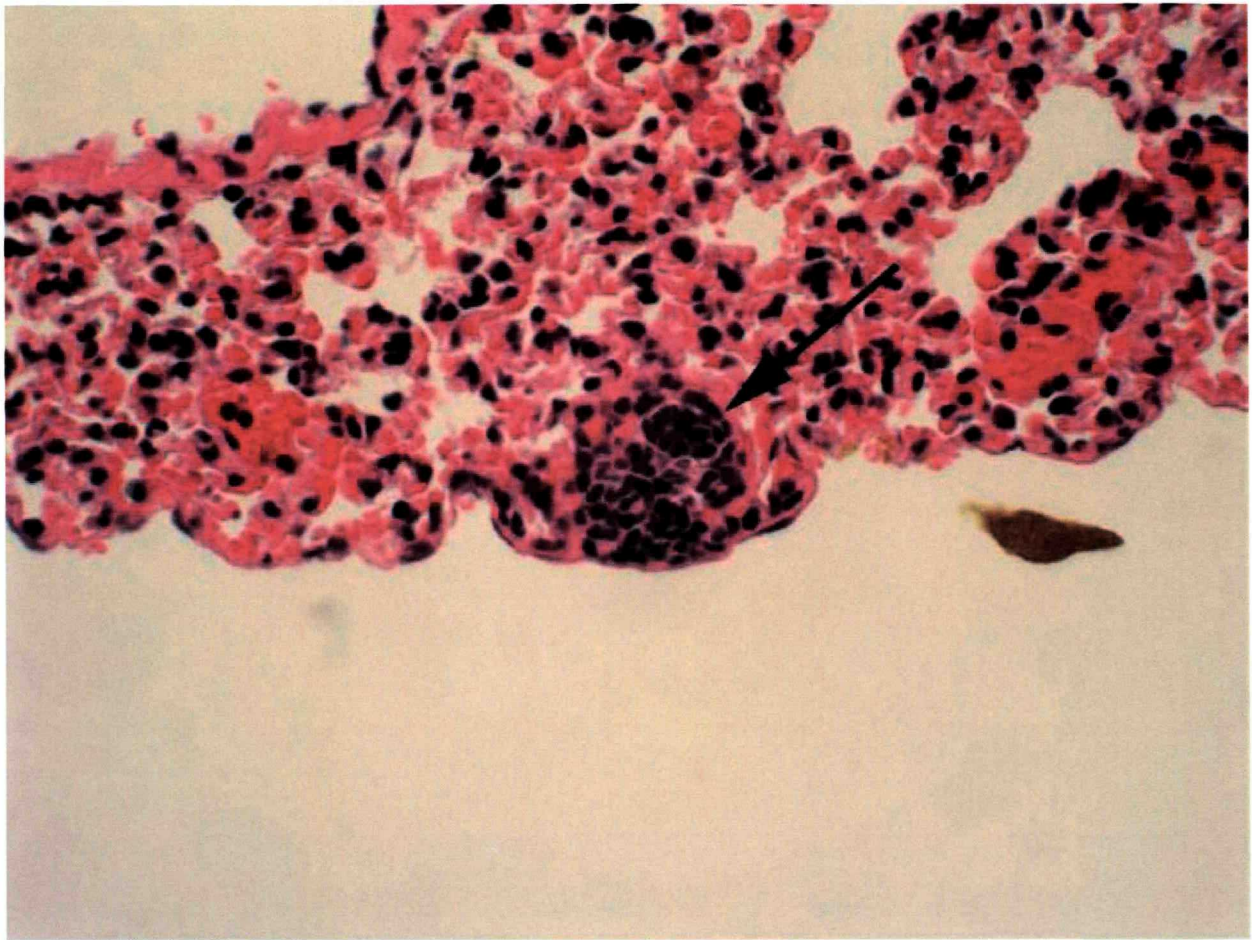


Figure 25

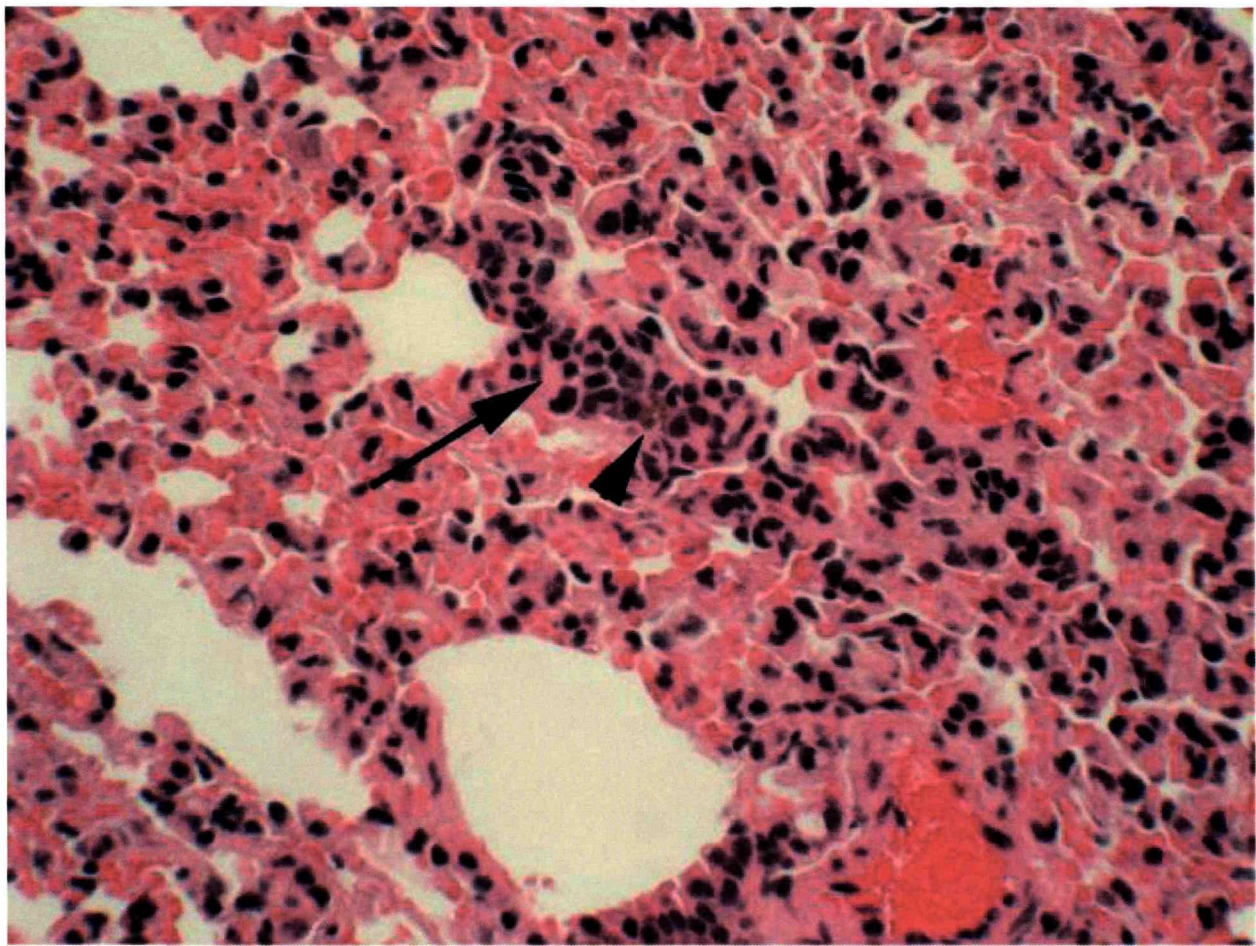


Figure 26

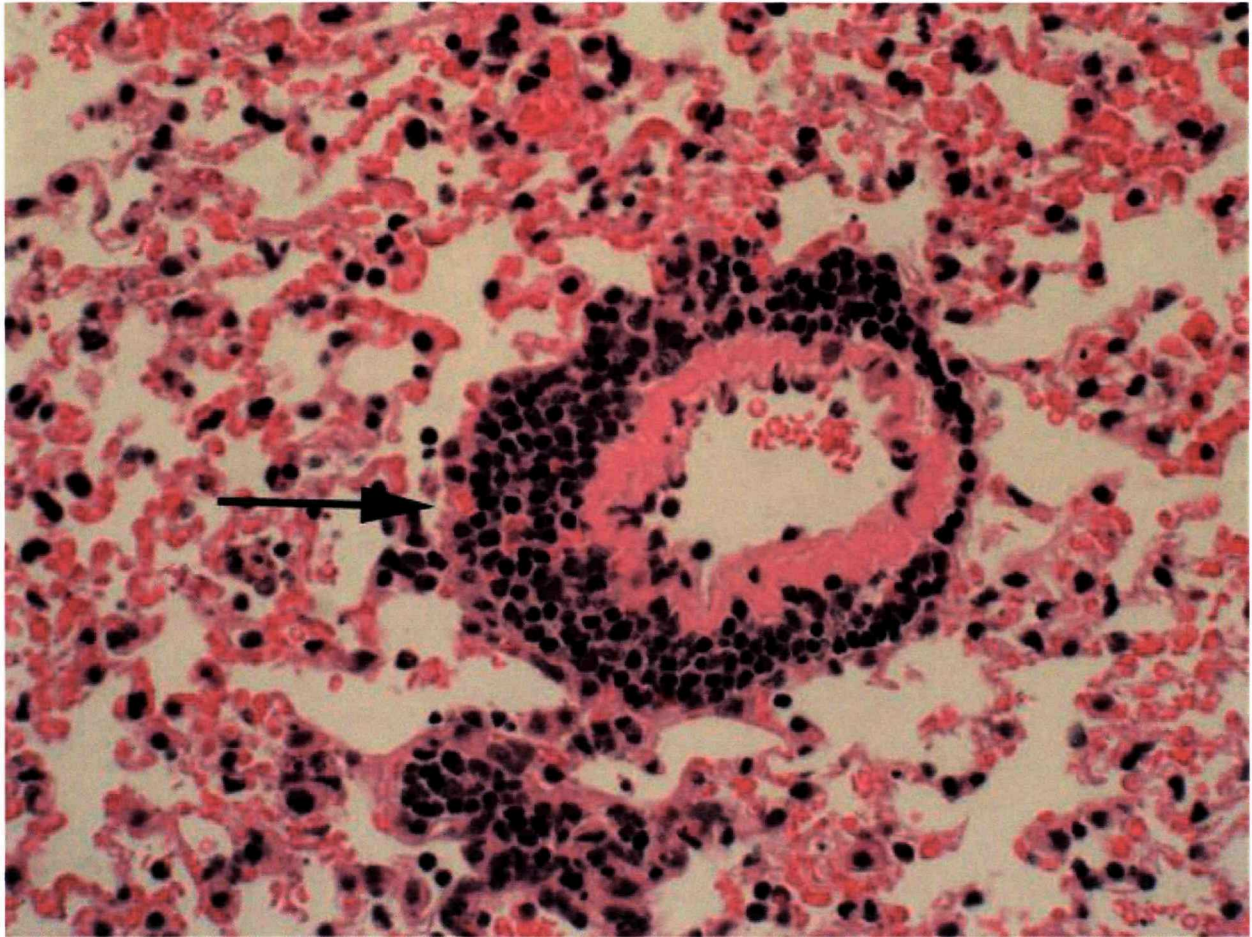


Figure 27

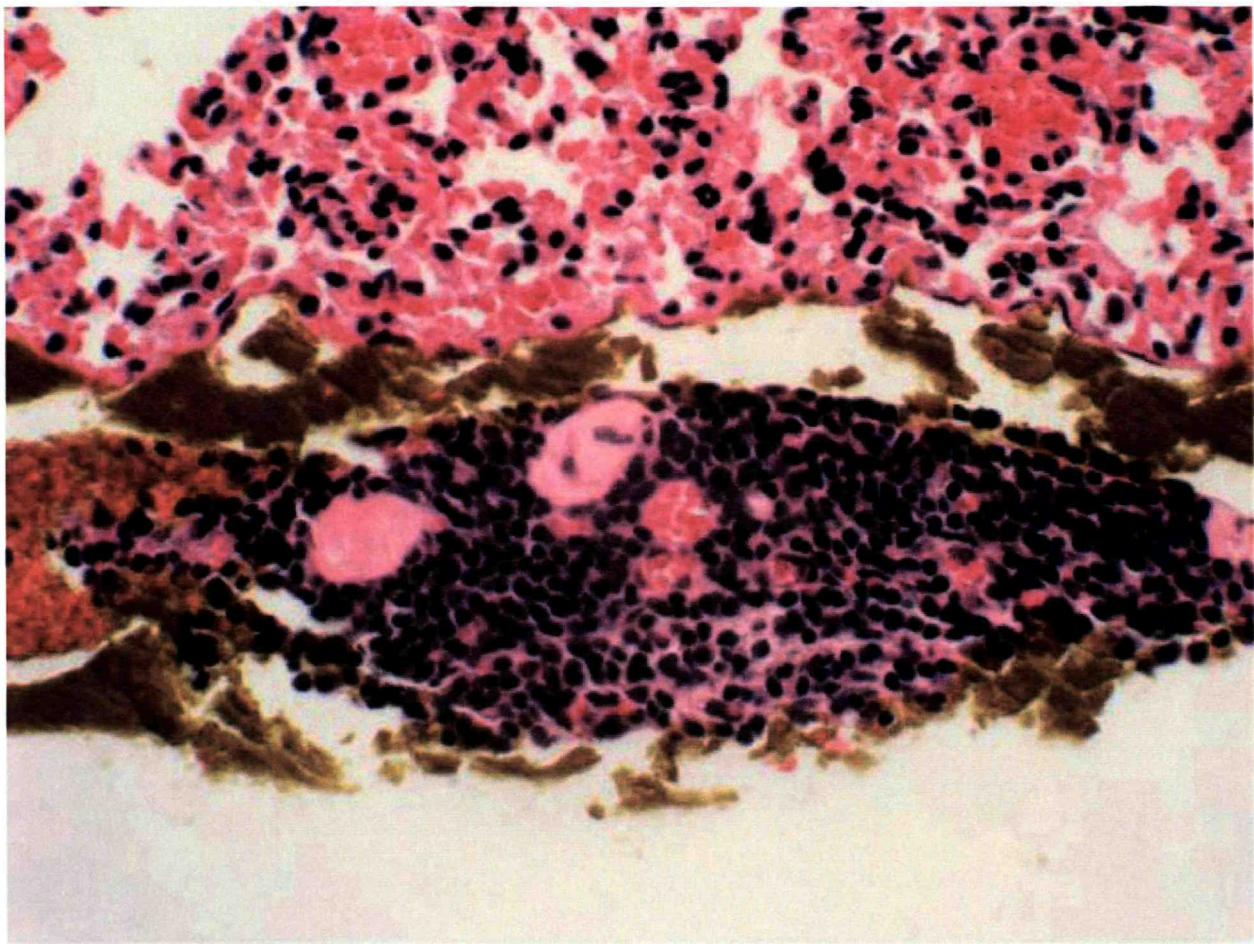


Figure 28



Figure 29



Figure 30

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Codes:

nos = target tissue not on the slide (at three different levels for specific target tissues); no score assigned

Severity: 0 = no lesion seen (nls), 1 = minimal lesion, 2 = mild lesion, 3 = moderate lesion, 4 = marked lesion, 5 = severe lesion

Distribution: f = focal (score = 0), mf = multifocal (1), d = diffuse (2); distribution scores are additive to lesion severity scores.

Note: Some tissues had more than one lesion, each lesion was scored according to severity and distribution, and these scores were additive for that tissue.

pv = perivascular, pb = peribronchial (peribronchiolar), pl = pleural, pp = periportal

l = lymphocytic, p = plasmacytic, n = neutrophilic, e = eosinophilic, h = histiocytic, gran = granulomatous (granuloma), fib = fibrosing (fibrosis)

ln = lymphoid nodule

ip = interstitial pneumonia

bp = bronchopneumonia

hep = hepatitis

euth hem = euthanasia hemorrhage (artifact of post-capture handling - scored as 0)

hemosid = hemosiderin

fb = foreign body

cocc = coccidia (*Eimeria* or *Isospora*)

crypto = cryptosporidia

flag = flagellated protozoa

cap = capillaria

rhabdo = rhabdomyolysis

mes = mesenteric

adj = adjacent

hyp = hyperplasia (hyperplastic)

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
R-A-3-1	nls	1mf lpn	1 mf ln	nls	1 mf lh, pv pb ip, focal schizont (photo), euth hem	1 mf lpn pv pb, euth hem	nos	1 mf lpn pv	nls	1 mf lp pv
R-A-3-1	0	2	2	0	5	3		2	0	2
R-A-5-1	1 f fibrosis, mucosal hyperplasia	1 f lpne	nos	1 mf lpne pv pb, 2 mf pb ln, 1 f gran	1 mf lpne pv pb, 1 f schizont	1 mf lpne pv	1 f ln	1 mf lpne pb, 2 f pb ln	1 f pb ln	1 mf ln pb, euth hem
R-A-5-1	2	1		7	4	2	1	4	1	2
R-A-9-1	nls	1 mf lp	1 mf lp	1 mf lpne pv	1 mf lpne pv	1 mf lpne pv	1 mf lp	1 mf lpne pv	1 mf lpne pv, 1 f pb ln	1 mf lpne pv, pb
R-A-9-1	0	2	2	2	2	2	2	2	3	3
R-A-11-1	nls	1 f lpn	1 mf lpne	1 mf lpne pv pb	2 mf lpne pv pb	2 mf lpne pv pb, 1 f hemosid	1 mf lpn	1 mf lpne pv pb	1 mf lpne pv pb, 1 mf pb ln	1 mf lpne pv pb, 1 f hemosid
R-A-11-1	0	1	2	3	4	5	2	3	5	4
R-A-18-1	1 f lpne	1 f lpne	1 f ln	1 f pb ln	1 mf lpne pv pb	1 mf lp pv ip	1 mf lp	nls	1 mf lp pv pb	1 f pb ln
R-A-18-1	1	1	1	1	3	3	2	0	3	1
R-A-19-1	nls	1 mf lpn	1 f ln	1 f subpleural ln, (photo)	nls	1 mf lpn pv	1 f ln	nls	nls	nls
R-A-19-1	0	2	1	1	0	2	1	0	0	0
R-A-25-1	1 f lpne	1 mf lp	nls	1 mf lpne pv ip	1 mf lp ip	1 mf lpne ip, 1 f pb ln	1 f lp	1 mf lp ip	1 mf lp ip	1 mf lp ip, 2 f pl ln
R-A-25-1	1	2	0	3	2	3	1	2	2	4
R-A-26-1	1 mf lpne	nls	nls	1 f lp pv	nls	nls	1 mf lpne, 2 f ln	1 mf lp pv	nls	1 mf lp pv
R-A-26-1	2	0	0	1	0	0	4	2	0	2
R-A-26-2	1 f lp	1 f lpne	1 mf lpne	1 mf lpne pv pb	2 mf pv pb ln	1 mf lpne pv, 2 f pl ln, euth hem	nos	1 mf lpne pv pb	1 f lpne pv, euth hem	1 mf lpne pv pb, 2 mf pb ln, euth hem
R-A-26-2	1	1	2	3	4	4		3	1	6
R-A-26-3	1 f lpne	1 mf lpne	nls	nls	nls	nls	nls	nls	nls, euth hem	2 mf lpne pb, 2 f pb ln
R-A-26-3	1	2	0	0	0	0	0	0	0	5
R-A-27-1	nls	nls	nls	nos	nos	nos	nls	1 mf lp pv	1 f pb ln	1 f pb ln
R-A-27-1	0	0	0				0	2	1	1

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
R-A-3-1	1 mf lpn pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-3-1	2	0	0	0	0	1	1	1	1	1
R-A-5-1	nls	1 f lp pv	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-5-1	0	1	0	0	1	1	1	1	1	1
R-A-9-1	nos (atrium)	nls	fb granuloma muscle tunic (hair or plant fiber)	nls	nls	nls	nls	1 f lpne	nls	nls
R-A-9-1		0	1	0	0	0	0	1	0	0
R-A-11-1	2 mf lpne pb pv, 1 f pv ln, 1 f gran	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-11-1	6	0	0	0	0	1	1	1	1	1
R-A-18-1	1 mf lp pb pv, euth hem	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-18-1	3	0	0	0	0	1	1	1	1	1
R-A-19-1	nls, euth hem	nls	nls	nls	nls	1 f lpne	1 f lpne, cocc, (photo)	1 f lpne, cocc	flag, cocc	flag, cocc
R-A-19-1	0	0	0	0	0	1	2	2	2	2
R-A-25-1	1 mf lp ip, 2 f pb ln	nls	nls	nls	nls	1 f lpne	nls	1 f lpne	flag	flag
R-A-25-1	4	0	0	0	0	1	0	1	1	1
R-A-26-1	nls	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-26-1	0	0	0	0	0	1	1	1	1	1
R-A-26-2	1 mf lpne pv pb, 1 f pl ln	nls	nls	nls	nls	nls	nls	nls	flag	nls
R-A-26-2	4	0	0	0	0	0	0	0	1	0
R-A-26-3	2 mf lpne pb pv, 1 f pb ln	nls	1 mf lpne	nls	nls	nls	1 f lpne, 1 cocc	1 f lpne, flag, cocc	flag, cocc	flag, cocc
R-A-26-3	5	0	2	0	0	0	2	3	2	2
R-A-27-1	1 f lp pb	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	flag	nls
R-A-27-1	1	0	0	0	0	1	2	1	1	0

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
R-A-3-1	nls	nos	nls	nls					
R-A-3-1	0		0	0				23 of 22	1.045
R-A-5-1	nls	nls	nls	nls					
R-A-5-1	0	0	0	0				31 of 23	1.348
R-A-9-1	nls	nls	nls	nls					
R-A-9-1	0	0	0	0				22 of 23	0.956
R-A-11-1	nls	nos	nls	nls					
R-A-11-1	0		0	0				40 of 23	1.739
R-A-18-1	nls	nls	nls	nls					
R-A-18-1	0	0	0	0				24 of 24	1.000
R-A-19-1	nls	nls	nls	nls					
R-A-19-1	0	0	0	0				16 of 24	0.667
R-A-25-1	nls	nls	nls	nls					
R-A-25-1	0	0	0	0				28 of 24	1.167
R-A-26-1	nls	nls	nls	nls					
R-A-26-1	0	0	0	0				16 of 24	0.667
R-A-26-2	nls	nos	nls	nls					
R-A-26-2	0		0	0				30 of 22	1.364
R-A-26-3	nls	nls	focal hemosid	nls					
R-A-26-3	0	0	1	0				25 of 24	1.042
R-A-27-1	nls	nls	nls	nls					
R-A-27-1	0	0	0	0				10 of 21	0.476

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
R-A-29-1	nls	1 mf lpne	nos	1 mf lpne pv pb ip	1 mf lpne pv pb, 1 mf pb ln, 1 f pl ln	1 mf lpne pv pb, 1 f hemosid	nos	1 mf lpne pv pb	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb, 1 f pb ln
R-A-29-1	0	2		4	6	4		3	4	4
R-A-31-1	nos probably sectioned through	1 f lp	1 mf lpne	1 mf lpne pv pb, 1 mf pb ln	1 mf lpn pv pb	1 mf lpne pv pb	1 mf lp	1 mf lpne pv pb	1 mf lpne pv pb	2 mf pb, pv pl ln, focal hemosid
R-A-31-1		1	2	5	3	3	2	3	3	5
R-A-32-1	nls	1 mf lpne	2 mf ln	1 mf lpn pb pv	nls	1 mf lpn pv pb	1 mf lp	1 mf lpn pv pb, 2 mf pb ln, 1 mf hemosid	1 f pb ln	1 mf lpn pv pb, 2 mf pb ln
R-A-32-1	0	2	3	3	0	3	2	8	1	6
R-A-36-1	1 f lpne	1 mf lpne	1 f ln	1 mf lpne pv pb, 2 f pb ln	nls	1 mf lpne pv pb	1 f lpne	1 mf lpne pv pb ip	1 mf lpne pv pb, 1 mf pb ln	1 mf lpne pv pb ip, 2 mf pb ln
R-A-36-1	1	2	1	5	0	3	1	4	5	7
R-A-40-1	1 mf lpne	nls	1 f ln	euth hem	nls	1 f lpn pv	nls	1 f lpne pv, euth hem	1 mf lpne pv pb, euth hem	1 mf lpne pv pb ip
R-A-40-1	2	0	1	0	0	1	0	1	3	4
R-A-48-1	nls	1 mf lpn	1 ln	1 mf lymph neut ip	1 mf lhn pv pb ip	1 mf lhn pv pb ip, euth hem	nls	1 mf lhne, 1 mf pb ln	1 mf lpne ip pb	1 mf lhne ip, 1 f pl ln (photo), euth hem
R-A-48-1	0	2	1	2	4	4	0	4	3	3
R-A-49-1	nls	1mf lpn, 1 f ln	nls	euth hem	1 mf lpn pb pv, euth hem	1 mf lpn pb pv, ip, euth hem	1 f ln	1 mf lpn pb pv ip	nls	1 mf lpn ip
R-A-49-1	0	3	0	0	3	4	1	4	0	2
R-A-55-1	1 f ln	nls	1 mf ln	1 mf lpne pv pb, 1 f pb ln	nls	1 f apical pl fibrosis, probable diaphragmatic adhesion	2 f ln	nls	2 f pb ln	2 mf pb ln
R-A-55-1	1	0	2	4	0	1	2	0	2	3
Pathos ¹						Pathos Factor = 2 Total Score =2				
R-A-56-1	1 f lp	1 mf lp	nls	1 mf lp pv	1 mf lp pv	1 mf lp pv	nls	1 mf lpne pv pb, euth hem	1 mf lpne pv pb	1 mf lpne pv pb, euth hem
R-A-56-1	1	2	0	2	2	2	0	3	3	3

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
R-A-29-1	1 mf lpne pv pb, 1 f pv ln	nls	nls	nls	nls	nls	1 f lpne	1 f lpne	flag	nls
R-A-29-1	4	0	0	0	0	0	1	1	1	0
R-A-31-1	1 mf lpne pv pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-31-1	3	0	0	0	0	1	1	1	1	1
R-A-32-1	1 mf lpn pv pb, 1 mf pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne, cocc	1 f lpne, cocc	flag	flag, ascarid ova
R-A-32-1	5	0	0	0	0	1	2	2	1	2
R-A-36-1	1 mf lpne pv pb ip, 1 mf pb pl ln, few syncytia	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	nls
R-A-36-1	8	0	0	0	0	1	1	1	1	0
R-A-40-1	1 mf lpne pv pb ip, 1 mf pb pl ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-40-1	6	0	0	0	0	1	1	1	1	1
R-A-48-1	1 mf lpne ip pv	nls	1 mf eos pv (lamina and muscluar)	nls	nls	1f lp	1f lp	1f lp	flag	1 f ne leiomyositis
R-A-48-1	3	0	2	0	0	1	1	1	1	1
R-A-49-1	1 mf lymph neu pv, ip, euth hem	nls	nls	nls	nls	2 f lpne	2 f lpne	2 f lpne	flag, cocc	flag, cocc
R-A-49-1	3	0	0	0	0	2	2	2	2	2
R-A-55-1	2 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag, nematode ova	nls
R-A-55-1	2	0	0	0	0	1	1	1	2	0
Pathos ¹										
R-A-56-1	1 mf lpne pv pb, 1 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-56-1	4	0	0	0	0	1	1	1	1	1

¹ The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
R-A-29-1	nls	nls	nls	nls					
R-A-29-1	0	0	0	0				34 of 22	1.545
R-A-31-1	nls	nls	nls	nos, proably sectioned through					
R-A-31-1	0	0	0					35 of 22	1.591
R-A-32-1	nls	anal papilloma	nls	1 unilateral f follicular cystic ectasia w colloid depletion, (photo)					
R-A-32-1	0	1	0	2				44 of 24	1.833
R-A-36-1	nls	nos	nls	nls					
R-A-36-1	0		0	0				41 of 23	1.783
R-A-40-1	nls	nls	1 d vacuolar change (zona fasciculata)	nls					
R-A-40-1	0	0	3	0				26 of 24	1.083
R-A-48-1	2 mf ne leiomyositis	nos	nls	nls					
R-A-48-1	3		0	0				36 of 23	1.565
R-A-49-1	nls	nos probably sectioned through	nls	nls					
R-A-49-1	0		0	0				30 of 23	1.304
R-A-55-1	nls	nls	nls	nls					
R-A-55-1	0	0	0	0				23 of 24	0.958
Pathos ¹									
R-A-56-1	nls	nls	nls	nls					
R-A-56-1	0	0	0	0				27 of 24	1.125

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
R-A-57-1	nls	1 mf lpne, 1 hemosid	1 f ln	1 mf lpne pv pb, 1 f hemosid	1 mf lpne pv pb ip	1 mf lpne pv pb ip	nls	1 mf lpne pv pb	1 mf lpne pv pb	1 mf lpne pv pb, 1 f apical pl fibrosis probable diaphragmatic adhesion
R-A-57-1	0	3	1	4	4	4	0	3	3	4
R-A-57-2	nls	1 mf lpn	1 f lp	1 f lpn pb	1 f lpn pv	euth hem	1 mf lpn	1 f lpn pv	1 f lpn pv	1 mf lpn pb pv, 1 mf pv pb ln, possible protozoan cyst, fb organized hair thromboembolus adj to pv ln (photo).
R-A-57-2	0	2	1	1	1	0	2	1	1	8
R-A-62-1	1 f ln	1 mf lpn	1 f lp	1 mf pv pb ln	1 f lh pb	1 f lhn pb, f pb hemosid	1 f ln	1 f lp pv	nls	1 mf pb lp, 1 f lh ip, 2 mf pb ln, 1 f hemosid (photo)
R-A-62-1	1	2	1	3	1	2	1	1	0	7
R-B-15-1	nls	nls	nls	1 mf lpne pv pb ip	1 mf lpne pv pb ip	1 mf lpne pv pb ip, 1 f e bp w pos nematode larva	nls	1 mf lpne pv pb ip	1 mf lpne pv	1 mf lpne pv, 1 f pl ln
R-B-15-1	0	0	0	4	4	6	0	4	2	3
R-C-3-1	nls	nls	nls	nls	1 f lpne	nls	nos	nls	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv, 1 f pl fibrosis, 1 f subpl lh
R-C-3-1	0	0	0	0	1	0		0	4	4
Pathos										Pathos Factor = 2 Total Score = 8
R-C-10-1	1 f lp	1 mf lpne	nls	nls	1 mf lpne pb pv ip, 1 f pb ln	1 mf lpne pv pb ip	nls	1 mf lpne pv ip	1 mf lpne pv ip	1 mf lpne pv ip, 1 f pb ln
R-C-10-1	1	2	0	0	5	4	0	3	3	4
R-C-14-1	nls	1 f lp	1 mf lpn, 1 f ln	1 mf lpne pv pb	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb	1 mf lpn, 1 f ln	1 mf lpne pv pb	1 mf lpne pv pb, 1 f hemosid	1 mf lpne pv pb
R-C-14-1	0	1	3	3	4	3	3	3	4	3

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
R-A-57-1	1 mf lpne pv pb	nls	1 f lpn pv leiomyositis, focal fb gran (hair or plant)	nls	nls	1 f lpne	2 f lpne	2 f lpne	flag	flag
R-A-57-1	3	0	2	0	0	1	2	2	1	1
R-A-57-2	1 f lp pl, euth hem	nls	nls	nls	nls	nls	nls	nls	nls	nls
R-A-57-2	1	0	0	0	0	0	0	0	0	0
R-A-62-1	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne	flag	flag
R-A-62-1	0	0	0	0	1	1	1	1	1	1
R-B-15-1	1 mf lpne pv pb ip	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
R-B-15-1	4	0	0	0	0	1	1	1	0	0
R-C-3-1	1 mf lpne pv, 1 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
R-C-3-1	3	0	0	0	0	1	1	1	0	0
Pathos										
R-C-10-1	1 mf lpne pv ip	nls	nls	nls	1 f lpne (photo)	1 f lpne	1 f lpne	1 f lpne	cocc, yeast or crypto (photo)	cocc, yeast or crypto (photo)
R-C-10-1	3	0	0	0	1	1	1	1	2	2
R-C-14-1	1 mf lpne pv pb, 1 mf pb pl ln	nls	1 f lp leiomyositis	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne	nls	nls
R-C-14-1	6	0	1	0	1	1	1	1	0	0

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
R-A-57-1	nls	nls	nls	nls			4 f perirectal abscess		
R-A-57-1	0	0	0	0			4	42 of 25	1.680
R-A-57-2	nls	nos, probably sectioned through	nls	nls					
R-A-57-2	0		0	0				18 of 23	0.783
R-A-62-1	nls	nls	nls	nls					
R-A-62-1	0	0	0	0				25 of 24	1.042
R-B-15-1	nls	nls	1 f lp	nls					
R-B-15-1	0	0	1	0				31 of 24	1.292
R-C-3-1	nls	nls	nls	nos probably sectioned through					
R-C-3-1	0	0	0					19 of 22	0.864
Pathos									
R-C-10-1	nls	nos, probably sectioned through	1 f lp	nls					
R-C-10-1	0		1	0				34 of 23	1.478
R-C-14-1	nls	nls	2 d cortical vacuolar change, zona fasciculata, reticularis	nls					
R-C-14-1	0	0	4	0				42 of 24	1.750

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
R-C-20-1	1 f lp	1 mf lp	1 f ln	1 mf lpne pv pb	1 mf lpne pv pb	1 mf lp pb	1 f ln	1 mf lpne pv pb	nls	1 mf lpne pv pb, 1 f pb ln
R-C-20-1	1	2	1	3	3	2	1	3	0	4
R-C-20-2	1 mf lpne	1 mf lpne, 1 f ln, 1 f submucosal edema	nls	nls	nls	1 mf lp pv pb, 1 f pv ln	1 mf lpne	1 mf lp pv pb	1 mf lpn pb pv, 1 f pb ln	1 f pl ln
R-C-20-2	2	4	0	0	0	4	2	3	4	1
R-D-3-1	nls	1 mf lpne	1 f lp	1 mf lpne pv	2 mf lpne pv (photo) pb, 2 f pb ln, euth hem	2 mf lpne pv pb	1 f lp	1 mf lp pv pb, 2 f pb ln	1 mf lmne pv pb	1 mf lp pv pb, tb some refractile material no rxn (prob fm slide prep)
R-D-3-1	0	2	1	2	6	4	1	5	3	3
R-D-4-1	1 mf lpne	1 mf lpne	nls	1 mf pv ln	nls	1 f lpne pv	1 mf lp	1 mf lpne pv pb	nls	1 mf lpne pv pb, 1 mf pb ln
R-D-4-1	2	2	0	2	0	1	2	3	0	5
R-D-18-1	nls	nls	2 mf ln	nls	1 f pb ln	2 f pb ln	nls	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb, 2 f pb ln
R-D-18-1	0	0	3	0	1	2	0	4	4	5
R-D-22-1	nls	nls	1 f ln	nls	nls, euth hem	1 mf lp pv, 1 f pb ln	1 f ln	1 mf lp pv, euth hem	1 mf lpne pv pb, 1 mf pb ln	1 mf lpne pv, 1 f pb ln
R-D-22-1	0	0	1	0	0	3	1	2	5	3
R-D-29-1	nls	1 mf lp, 1 f ln	1 f ln	1 mf lp pv pb	1 f lpne pv, euth hem	1 mf lpne pv pb, euth hem	nos	1 mf lpne pv pb, 1 f pl ln	1 mf lpne pv pb	1 mf lpne pv pb, 2 mf pb pl ln, euth hem
R-D-29-1	0	3	1	3	1	3		4	3	7
S-A-2-1	nls	nls	nls	nls	nls	1 f pl ln	nls	1 mf lp pv, 1 f pb ln	1 mf lpne pv pb	1 mf lpne pv pb
S-A-2-1	0	0	0	0	0	1	0	3	3	3
S-A-3-1	1 mf lpne	1 f lp	nls	1 mf lpne pv	1 mf lpne pv	1 mf lpne pv	nls	1 mf lpne pv	1 mf lpne pv, 1 f pb ln	1 mf lpne pv
S-A-3-1	2	1	0	2	2	2	0	2	3	2

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
R-C-20-1	1 mf lpne pv pb, 2 f pl ln	nls	1 f lp leiomyositis	nls	1 f lpne	1 f lpne, 1 f glandular herniation	1 f lpne	1 f lpne	nls	nls
R-C-20-1	5	0	1	0	1	2	1	1	0	0
R-C-20-2	1 mf lpne pv pb, 2 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
R-C-20-2	5	0	0	0	0	1	1	1	0	0
R-D-3-1	1 mf lpne, pb, pv	1 mf eos pv (lamina and muscular)	1 mf eos pv (lamina and muscular)	nls	nls	1 f lpne	1 lpne, 1 cocc	1 f lpne	flag, cocc	flag, cocc
R-D-3-1	3	2	2	0	0	1	2	1	2	2
R-D-4-1	1 mf lpne pv pb, 1 mf pb ln, euth hem	nls	nls	nls	nls	nls	nls	1 f lpne	nls	nls
R-D-4-1	5	0	0	0	0	0	0	1	0	0
R-D-18-1	1 mf lpne pv pb, 2 mf pb ln	nls	1 focal mucosal hyp/hyp associated w fb granuloma (plant)	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	nls
R-D-18-1	6	0	2	0	0	1	1	1	1	0
R-D-22-1	1 mf lp pv, 1 f pb ln	nls	nls	nls	nls	nls	nls	1 f lpne, flag	flag	flag
R-D-22-1	3	0	0	0	0	0	0	2	1	1
R-D-29-1	2 mf lpne pv pb, 1 mf pb ln, 1 f eos bp	nls	nls	1 f ne	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
R-D-29-1	7	0	0	1	0	1	1	1	0	0
S-A-2-1	1 mf lp pv	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne	flag, 1 f glandular herniation	nls
S-A-2-1	2	0	0	0	1	1	1	1	2	0
S-A-3-1	1 mf lpne pb pv, 1 mf pv ln	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne, cestode	1 f lpne	nls	nls
S-A-3-1	5	0	0	0	1	1	2	1	0	0

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
R-C-20-1	nls	nls	nls	nls					
R-C-20-1	0	0	0	0				31 of 24	1.292
R-C-20-2	nls	nls	nls	nls					
R-C-20-2	0	0	0	0				28 of 24	1.167
R-D-3-1	nls	nls	1 f lp (photo), 1 d vacuolar change zona fasciculata	nls					
R-D-3-1	0	0	4	0				46 of 24	1.917
R-D-4-1	nls	nls	nls	nls					
R-D-4-1	0	0	0	0				23 of 24	0.958
R-D-18-1	nls	nls	nls	nls					
R-D-18-1	0	0	0	0				31 of 24	1.292
R-D-22-1	nls	nls	nls	nls			4 f perirectal abscess		
R-D-22-1	0	0	0	0			4	26 of 25	1.040
R-D-29-1	1 f crypto abscess	1 f lpn	nls	nls					
R-D-29-1	2	1	0	0				39 of 23	1.696
S-A-2-1	nls	nls	nls	nls					
S-A-2-1	0	0	0	0				18 of 24	0.750
S-A-3-1	nls	nls	nls	nls					
S-A-3-1	0	0	0	0				26 of 24	1.083

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
S-A-4-1	1 f lp	nls	nos	nos	nos	nos	1 f lpne, 2 mf ln	1 mf lpne pb	1 mf lpne pv pb	1 mf lpn pv pb, 1 mf pb ln
S-A-4-1	1	0					4	2	3	5
S-A-4-2	nls	1 mf lpne	1 f ln	1 f pb ln	1 f lp pv	1 f lp pv	1 f ln	1 mf lp pv	1 mf lp pv pb	1 mf lp pv
S-A-4-2	0	2	1	1	1	1	1	2	3	2
S-A-5-1	1 f lp	nls	1 mf lp	1 mf lpne pv, euth hem	1 mf lpne pv, 1 mf pb ln	1 mf lpne pv, euth hem	1 mf lp	2 mf lpne pv pb	1 mf lpne pv pb	2 mf pb pl ln
S-A-5-1	1	0	2	2	4	2	2	4	3	4
S-A-5-2	1 mf lpne	1 mf lp	1 f ln	1 mf lp pv	1 mf lp pv pb	1 mf lp pv	nls	1 mf lp pv pb, 2 mf pb ln, few syncytia	1 mf lp pv pb, few syncytia	1 mf lpne pv pb, few syncytia
S-A-5-2	2	2	1	2	3	2	0	7	4	4
S-A-6-1	nls	1 mf lp	nls	1 f lp pv	1 mf lpne pv, 1 f pb ln	nls	nls	1 mf lp pv	1 mf lp pv pb	1 mf lpne pv pb
S-A-6-1	1	2	0	1	3	0	0	2	3	3
S-A-9-1	1 mf lpne	1 mf lp	1 d lp	1 mf lpne pv pb, 2 mf pb ln	1 mf lpne pv pb, 2 mf pb ln	1 mf lpne pv pb	1 d lp	2 mf lpne pv pb, few cytoplasmic clear inclusions in	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb, 2 mf pb pl ln
S-A-9-1	2	2	3	6	6	3	3	5	4	7
S-A-11-1	nls	1 f lp	nls	f besnoitia gran	1 mf lp pv ip	1 mf lp pv ip, 1 f pb ln	1 mf lp, 1 f ln	1 mf lpne pv ip, f besnoitia gran	1 mf lpne pv ip, 1 f pb ln	1 mf lpne pv ip, 2 mf pb ln
S-A-11-1	0	1	0	1	3	4	3	4	4	6
S-A-12-1	nls	1 mf lp	1 mf ln	nls	2 f pb ln	1 f lp pb	nls	nls	1 f lpne pv	nls
S-A-12-1	0	2	2	0	2	1	0	0	1	0
S-A-17-1	1 f lp	nls	1 f lp	1 f lpn pv	1 f lne pv	1 mf lp pv	nls	1 mf lpn pv ip	1 mf lpne pv pb, 2 mf pb ln	1 mf lpne pv pb ip
S-A-17-1	1	0	1	1	1	2	0	3	6	4
S-A-19-1	nls	nls	1 f ln	1 mf lpne pv pb ip, 1 f pb ln	2 mf lpne pv pb ip	1 mf lpne pv pb ip	1 mf lpn	1 mf lpne pv pb ip	1 mf lpne pv pb ip, euth hem	1 mf lpne pv pb ip, 1 mf pb ln, euth hem
S-A-19-1	0	0	1	5	5	4	2	4	4	6

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
S-A-4-1	1 mf lpn pb pv	nls	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	nematode ova	nls
S-A-4-1	3	0	0	0	0	0	1	2	1	0
S-A-4-2	1 mf lp pv, 2 mf pl ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-A-4-2	5	0	0	0	0	1	1	1	1	1
S-A-5-1	1 mf lp pv, 1 f pl adhesion	nls	nls	nls	nos, probably sectioned through	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-A-5-1	3	0	0	0		1	1	1	1	1
S-A-5-2	nos	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
S-A-5-2		0	0	0	0	1	1	1	0	0
S-A-6-1	nls	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
S-A-6-1	0	0	0	0	0	1	1	1	0	0
S-A-9-1	2 mf lphne pv pb, 1 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-A-9-1	5	0	0	0	0	1	1	1	1	1
S-A-11-1	1 mf lpne pv ip, 1 mf pb ln, f besnoitia gran	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-A-11-1	6	0	0	0	0	1	1	1	1	1
S-A-12-1	1 mf pb ln	1 f adventitial ln	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
S-A-12-1	2	1	0	0	0	1	1	1	0	0
S-A-17-1	1 mf lpne pv pb ip	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	flag	flag
S-A-17-1	4	0	0	0	0	1	2	1	1	1
S-A-19-1	1 mf lpne pv pb ip, 2 mf pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-A-19-1	7	0	0	0	0	1	1	1	1	1

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
S-A-4-1	nls	nos, probably sectioned through	nls	nls					
S-A-4-1	0		0	0				22 of 19	1.158
S-A-4-2	nls	nos	nls	nls					
S-A-4-2	0		0	0				24 of 23	1.043
S-A-5-1	1 mf lp	1 f lp	nls	nls			4 f perirectal bacterial abscess		
S-A-5-1	2	1	0	0			4	39 of 24	1.625
S-A-5-2	nls	nls	nls	nls					
S-A-5-2	0	0	0	0				30 of 23	1.304
S-A-6-1	nls	nls	nls	nls					
S-A-6-1	0	0	0	0				18 of 24	0.750
S-A-9-1	nls	nls	nls	nls					
S-A-9-1	0	0	0	0				51 of 24	2.125
S-A-11-1	flag	nls	nls	nls					
S-A-11-1	1	0	0	0				38 of 24	1.583
S-A-12-1	nls	nls	nls	nls					
S-A-12-1	0	0	0	0				14 of 24	0.583
S-A-17-1	nls	nos	nls	nls					
S-A-17-1	0		0	0				29 of 23	1.261
S-A-19-1	nls	nos	1 d vacuolar change, zona fasciculata	1 d follicular epithelial hypertrophy,					
S-A-19-1	0		3	4				50 of 23	2.174

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
S-A-21-1	nls	1 f lpne	nls	nls	1 mf lpne pv pb, 1 f pl ln, few in inclusions	1 mf lpne pv pb ip, 1 mf pb ln, few intrabronchiolar	1 f ln	1 f lpne pv pb, 1 hemosid, 1 f pl ln	1 f lpne pv pb, 1 pb ln, hepatozoan, in inclusion??	1 mf lpne pv pb ip, 1 mf pb ln
S-A-21-1	0	1	0	0	5	7	1	4	4	6
S-A-29-1	1 mf lpne	1 f lne	1 f lpne	1 f lp pv, 1 f pl ln	nls	1 f pl ln	nos	1 f lp pv pb, 1 pb ln	1 f pl ln	1 mf lpne pv pb, 1 f pl ln
S-A-29-1	2	1	1	2	0	1		3	1	4
S-A-31-1	1 mf eos	nls	1 mf lpne	1 mf lpne pv pb	1 mf lpne pv pb	1 mf lpne pv pb	nls	1 f lpne pv	1 mf lpne pv	1 mf lpne pv pb
S-A-31-1	2	0	2	3	3	3	0	1	2	3
S-B-1-1	nls	nls	1 f lpn	1 f pb ln, 1 f lp pv	nls	nls	nls	1 f pb ln	1 f pb lp, 1 hemosid	1 mf n pv, euth hem
S-B-1-1	0	0	1	2	0	0	0	1	2	2
S-B-6-1	1 mf lp	1 mf lp	1 mf lp	nls	1 mf lpne pv pb ip	1 f lp pv	nls	1 mf lp pv pb	1 mf lp pv pb	1 mf lp pv pb, 1 f pl ln
S-B-6-1	2	2	2	0	4	1	0	3	3	4
S-B-28-1	1 mf lp	1 mf lp	1 f lp	1 f lp pv, 1 f pb ln, euth hem	1 mf lpn pv, euth hem	1 lpn pv ip, 1 f hemosid, euth hem	nos	1 mf lpn pv pb	1 mf lpn pv pb	1 mf lpn pv pb
S-B-28-1	2	2	1	2	2	3		3	3	3
S-B-33-1	1 f lpne	3 f e gran	1 f lp	endothelial intranuclear e inclusions, euth	1 mf lpne pv, inclusions, euth hem	1 mf lpne pv pb ip, inclusions, euth hem	1 f lp	1 mf lpne pv ip, inclusions	1mf lpne ip pb pv, 1 mf pb ln, inclusions	1 mf lpne pv pb ip, 1 mf lp pleuritis with mesothelial
S-B-33-1	1	3	1	1	3	5	1	4	7	7
Pathos										Pathos Factor = 2 Total Score = 14
S-B-35-1	nls	1 mf lp	nos	1 mf e pv	nls	1 f lp pv	nos	1 f lp pb	nls	nls
S-B-35-1	0	2		2	0	1		1	0	0
S-C-7-1	nls	1 mf lp	1 mf lpne	1 mf lp pv pb, euth hem	euth hem	1 mf lp pv, euth hem	1 f ln	1 mf lp pv	euth hem	1 mf lp pv pb
S-C-7-1	0	2	2	3	0	2	1	2	0	3
Pathos										

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
S-A-21-1	1 mf lpne pv pb ip, 2 mf pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
S-A-21-1	7	0	0	0	0	1	1	1	0	0
S-A-29-1	nls	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	nls	nls
S-A-29-1	0	0	0	0	0	1	1	1	0	0
S-A-31-1	1 mf lpne pv pb	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne, cestode	1 f lpne	flag	flag
S-A-31-1	3	0	0	0	1	1	2	1	1	1
S-B-1-1	nls	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	flag	flag
S-B-1-1	0	0	0	0	0	1	2	1	1	1
S-B-6-1	1 mf lp pv pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne, cocc	flag	flag
S-B-6-1	3	0	0	0	0	1	1	2	1	1
S-B-28-1	1 mf lpn pv pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-B-28-1	3	0	0	0	0	1	1	1	1	1
S-B-33-1	1 mf pv pb ip, 1 f pl fibrosis, 2 mf hemosid	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-B-33-1	8	0	0	0	0	1	1	1	1	1
Pathos										
S-B-35-1	nls	nls	1 mf lpe nemaode larvae, erythrphagocytosis	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne, flag	1 f lpne, flag
S-B-35-1	0	0	4	0	0	1	1	1	2	2
S-C-7-1	1 mf lp pv pb, 1mf l pl fibrosis	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	yeast	yeast
S-C-7-1	5	0	0	0	0	1	1	1	1	1
Pathos	Pathos Factor = 2 Total Score = 10									

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
S-A-21-1	nls	nls	nls	nls			4 f perirectal abscess		
S-A-21-1	0	0	0	0			4	42 of 25	1.680
S-A-29-1	nls	nls	nls	nls					
S-A-29-1	0	0	0	0				18 of 23	0.783
S-A-31-1	nls	nls	nls	nls			4 f perirectal abscess with tract (photo)		
S-A-31-1	0	0	0	0			4	33 of 25	1.320
S-B-1-1	nls	nls	nls	nls					
S-B-1-1	0	0	0	0				14 of 24	0.583
S-B-6-1	nls	nls	nls	possible colloid depletion					
S-B-6-1	0	0	0	1				31 of 24	1.292
S-B-28-1	nls	nls	nls	nls					
S-B-28-1	0	0	0	0				29 of 23	1.261
S-B-33-1	nls	nls	1 f lpne (medulla)	nls			4 f bacterial abscess in skin of perianal region		
S-B-33-1	0	0	1	0			4	58 of 25	2.320
Pathos									
S-B-35-1	nls	nls	nls	nls					
S-B-35-1	0	0	0	0				17 of 22	0.773
S-C-7-1	nls	nls	nls	nls					
S-C-7-1	0	0	0	0				30 of 24	1.250
Pathos									

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
S-C-9-1	1 mf lpne	nls	1 mf lpne	nls	1 mf lpne pv pb, 1 f hemosid	1 mf lpne pb pv	1 mf lpne	1 mf lpne pv pb, 1 mf hemosid	1 mf lpne pv pb	1 mf lpne pv pb ip, 1 f schizont
S-C-9-1	2	0	2	0	4	3	2	5	3	5
S-C-11-1	nls	nls	1 mf ln	1 mf lpn pv pb	1 mf lpn pv pb	1 mf lp pv pb	1 f ln	1 mf lpn pv pb	1 mf lpne pv pb, euth hem	1 mf lpne pv pb, 1 f pv ln
S-C-11-1	0	0	2	3	3	3	1	3	3	4
S-C-16-1	1 mf lpne	1 mf lpne	nos	1 mf lp pv pb	1 mf lpne pv pb	1 mf lp pv pb	nos	1 mf lp pv pb, 1 mf pb ln, 1 f eos bp	1 mf lpne pv pb	1 mf lpne pv pb, 2 mf pb ln, 1 f hemosid
S-C-16-1	2	2		3	3	3		6	3	7

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues **and other tissues of interest** in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
S-C-9-1	1 mf lpne pv pb, 1 mf hemosid	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	flag	flag
S-C-9-1	5	0	0	0	0	1	2	1	1	1
S-C-11-1	1 mf lpne pv pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag, nematode larvae	nls
S-C-11-1	3	0	0	0	0	1	1	1	2	0
S-C-16-1	1 f lp pv	nls	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	flag	nls
S-C-16-1	1	0	0	0	0	1	2	1	1	0

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thryoid	Spleen	Liver	Bot Lesion	Total	Score
S-C-9-1	nls	nls	nls	nls			4 f perirectal abscess		
S-C-9-1	0	0	0	0			4	41 of 25	1.640
S-C-11-1	nls	nls	nls	nls		1 mf pp lpne, 3 mf gran fib hep, cap adults			
S-C-11-1	0	0	0	0		7		37 of 25	1.480
S-C-16-1	nls	nls	1 d vacuolar change, zoona fasciculata	nos					
S-C-16-1	0	0	3					38 of 21	1.810

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
S-D-1-1	2 mf lpne	1 mf lp	1 f ln	1 mf lp pb, 1 mf pb ln	1 f lp pv	1 mf lp pv pb, 1 f pb ln	1 mf lp	1 mf lp pv pb, few syncytia	1 mf lp pv pb, 1 f pb ln	1 mf lp pv pb, 2 mf pb ln, f schizont
S-D-1-1	3	2	1	4	1	4	2	4	4	7
S-D-4-1	1 mf lpne	1 mf lpne	1 mf ln	1 f pb ln	1 f pb ln	nls	1 mf ln	euth hem	1 f pl lpne	2 f pb ln, euth hem
S-D-4-1	2	2	2	1	1	0	2	0	1	2
S-D-7-1	1 mf lp	1 mf lp	1 f lp	1 mf lp pv pb, 1 f pb ln	1 mf lp pv pb, 1 f pb ln	1 mf lp pv pb, 1 f pb ln	1 mf lp	1 mf lpne pv	1 mf lp pv pb	1 mf lp pv pb
S-D-7-1	2	2	1	4	4	4	2	2	3	3
S-D-10-1	1 f lp	1 mf lp	1 mf lp	1 mf lp pv	nls	1 mf lp pv pb	nls	1 f lp pv	1 mf lpne pv pb, 1 f hemosid	1 mf lp pv pb, 1 f hemosid
S-D-10-1	1	2	2	2	0	3	0	1	4	4
S-D-11-1	1 mf lpne	1 mf lp	nls	nls	nls	nls	nls	nls	nls	2 mf pb ln
S-D-11-1	2	2	0	0	0	0	0	0	0	3
S-D-18-1	nls	1 mf lpne	1 mf lp, 1 mf ln	1 mf lp	1 f pb ln	nls	2 f ln	1 mf lp pv	nls	1 mf lp pv
S-D-18-1	0	2	4	2	1	0	2	2	0	2
S-D-19-1	nls	2 mf lpne	1 f ln	1 mf lp pv	nls	1 f lp pv	1 mf lp	nls	1 mf lpne pv	1 mf lp pb pv, 1 f pb ln
S-D-19-1	0	3	1	2	0	1	2	0	2	4
S-E-12-1	1 f lp	1 mf lpne	1 f ln	1 mf lpne pv, 1 f pl ln	1 mf lpne pv pb	1 mf lpne pv pb	1 f ln	1 mf lpne pv pb, 1 mf pv pb ln	1 mf lpne pv pb, 1 f pb ln	1 mf lpne pv pb, 1 mf pb ln
S-E-12-1	1	2	1	3	3	3	1	6	4	5
S-E-18-1	nls	1 f lp	1 f lp	nls	nls	1 mf lp pv pb, 1 f pb ln	1 f ln	1 mf lp pv pb	1 f pb ln	1 mf lpne pv, 1 f pb ln
S-E-18-1	0	1	1	0	0	4	1	3	1	3
S-F-1-1	1 mf lp	1 mf lpne	1 mf lp	1 mf lpne pb, 2 mf pb ln	1 mf lpne pv, 1 f pb ln	1 mf lpne pv pb, few syncytia	1 mf lpne	1 mf lpne pv pb, 1 f besnoitia cyst, pos	1 mf lpne pv pb, 1 f pb ln, hepatozoan, few intranuclear	2 mf lpne pv pb, 1 mf pb ln, 2 f pl ln, 1 f nematode ova
S-F-1-1	2	2	2	5	3	4	2	5	6	12

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
S-D-1-1	1 mf lpne pv pb, 1 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-D-1-1	4	0	0	0	0	1	1	1	1	1
S-D-4-1	1 f pl ln	nls	1 mf lpne	1 f erosion	nls	1 f lpne	1 f lpne, cocc	1 f lpne, cocc, nematodes (pinworm-like)	nls	nls
S-D-4-1	1	0	2	1	0	1	1	3	0	0
S-D-7-1	1 mf lp pv pb	1 f lp leiomyositis, f pustule w acantholytic cells	nls	1 mf eos	nls	1 f lpne	1 f lpne	1 f lpne	nematodes	nls
S-D-7-1	3	2	0	2	0	1	1	1	1	0
S-D-10-1	1 mf lp pv pb	nls	nls	nls	nls	nls	nls	nls	flag	flag
S-D-10-1	3	0	0	0	0	0	0	0	1	1
S-D-11-1	nls	nls	nls	nls	nls	nls	nls	nls	1 nematodes (pinworm-like)	nls
S-D-11-1	0	0	0	0	0	0	0	0	1	0
S-D-18-1	nls	nls	1 mf lpne	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	nls	nls
S-D-18-1	0	0	2	0	0	1	2	1	0	0
S-D-19-1	1 mf lp pv, pb, 2 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 nematodes (pinworm-like)	nls
S-D-19-1	5	0	0	0	0	1	1	1	1	0
S-E-12-1	1 mf lpne pv pb, 1 mf pv pb ln	1 f mucosal crust	nls	nls	nls	1 f lpne	1 f lpne, cestode	1 f lpne	few nematodes	nls
S-E-12-1	6	1	0	0	0	1	2	1	1	0
S-E-18-1	1 mf lpne pv pb, 1 f pb ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	few nematodes	nls
S-E-18-1	4	0	0	0	0	1	1	1	1	0
S-F-1-1	1 mf lpne pv pb, 1 mf pb pl ln, 1 f nematode ovum	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne, flag	flag	flag
S-F-1-1	7	0	0	0	0	1	1	2	1	1

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thyroid	Spleen	Liver	Bot Lesion	Total	Score
S-D-1-1	nls	nls	nls	nls		1 mf lpne pp, 3 mf gran fib hep, cap ova			
S-D-1-1	0	0	0	0		7		48 of 25	1.920
S-D-4-1	nls	nls	nls	nls					
S-D-4-1	0	0	0	0				22 of 24	0.917
S-D-7-1	nls	nls	nls	nls					
S-D-7-1	0	0	0	0				38 of 24	1.583
S-D-10-1	nls	nls	nls	nls					
S-D-10-1	0	0	0	0				24 of 24	1.000
S-D-11-1	nls	nls	nls	nls		1 mf lpne pp, 4 mf gran hep cap adults, larvae and			
S-D-11-1	0	0	0	0		8		16 of 25	0.640
S-D-18-1	nls	nos probably sectioned through	cortex nls, no medulla, probably sectioned through	nos					
S-D-18-1	0		0					21 of 22	0.955
S-D-19-1	nls	nls	nls	nls					
S-D-19-1	0	0	0	0				24 of 24	1.000
S-E-12-1	nls	nos	1 d vacuolar change (zona fasciculata)	nls		2 mf lpne pp, 3 mf gran fib hep cap ova			
S-E-12-1	0		3	0		8		52 of 24	2.167
S-E-18-1	nls	nls	nls	nls		1 mf lpne pp, 4 mf gran fib hep cap ova			
S-E-18-1	0	0	0	0		8		30 of 25	1.200
S-F-1-1	nls	nls	1 mf lymph	nls	nls	1 mf lpne pp, 4 mf gran hep cap adults, larvae and			
S-F-1-1	0	0	2	0	0	8		66 of 26	2.538

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
S-F-2-1	1 mf eos	1 mf lpne	1 mf lp	2 mf lpne pv pb, 1 f pl ln	1 mf lpne pv pb, 1 f pb ln	2 lpne pv pb	1 mf lp	1 mf lpne pv pb	1 mf lpne pv pb	1 mf lpne pv pb , 1 mf pb ln
S-F-2-1	2	2	2	5	4	3	2	3	3	5
S-F-3-1	1 f lpne	1 mf lpne	nos	1 mf n pv	1 mf lpn pv pb	1 mf lpne pv pb,1 syncytial cell	nos	1 mf lpne pv pb	1 f pl ln	1 mf ne pv, 2 mf pl ln, euth hem
S-F-3-1	1	2		2	3	4		3	1	5
S-F-15-1	1 mf lpne, nematode larva in mucosal epithelium	1 mf lpne	1 mf lp	1 mf lpne pv	1 mf lpne pv	1 mf lpne pv pb	1 mf lp	1 mf lpne pv pb pl	nls	1 mf lpne pv pb, 1 f pl ln
S-F-15-1	3	2	2	2	2	3	2	4	0	4
S-F-16-1	nls	nls	1mf lp,1 f ln	1 mf lpne pv pb, 1 f pb ln, 1 f hemosid	nls	1 mf lp pv pb, 1 focal giant cell with hemosid	1 mf lp, 1 mf ln	nls	nls	nls
S-F-16-1	0	0	3	5	0	5	4	0	0	0

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus	Duodenum	Jejunum	Ileum	Cecum	Colon
S-F-2-1	1 mf lpne pv pb , 2 mf pb ln	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	1 f lpne	flag	flag
S-F-2-1	6	0	0	0	1	1	1	1	1	1
S-F-3-1	1 mf lpne pv pb	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne, 1 glandular herniation	1 f lpne	1 f lpne few in inclusions (herpes or adeno-like)
S-F-3-1	3	0	0	0	0	1	1	2	1	2
S-F-15-1	1 mf lpne pv pb, 1 f pl ln	nls	nls	nls	nls	1 f lpne	1 f lpne	1 f lpne	several nematode larva and adults (pinworm-like)	nls
S-F-15-1	4	0	0	0	0	1	1	1	1	0
S-F-16-1	1 mf lp pv pb, few syncytia	nls	nls	nls	nls	nls	nls	nls	flag	nls
S-F-16-1	5	0	0	0	0	0	0	0	1	0

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 1. Histologic lesions in target tissues and other tissues of interest in deer mice (Peromyscus maniculatus) from Libby Superfund Site

Mouse #	Rectum	Anus	Adrenal	Thryoid	Spleen	Liver	Bot Lesion	Total	Score
S-F-2-1	nls	nos	nls	nls		1 mf lpne pp, 4 mf gran hep cap adults, larvae and			
S-F-2-1	0		0	0		8		51 of 24	2.125
S-F-3-1	nls	nos	nls	nls		1 mf lpne pp, 4 mf gran fib hep cap ova			
S-F-3-1	0		0	0		8		39 of 22	1.773
S-F-15-1	nls	nos, probably sectioned through	nls	nls		1 mf lpne pp, 4 mf gran hep, cap adults, larvae and			
S-F-15-1	0		0	0		8		40 of 24	1.667
S-F-16-1	nls	nos	nls	nls					
S-F-16-1	0		0	0				23 of 23	1.000

1 The Pathos factor for all tissues is 1 unless otherwise indicated in this appendix table.

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site

Codes:

nos = target tissue not on the slide (at three different levels for specific target tissues); no score assigned

Severity: 0 = no lesion seen (nls), 1 = minimal lesion, 2 = mild lesion, 3 = moderate lesion, 4 = marked lesion, 5 = severe lesion

Distribution: f = focal (score = 0), mf = multifocal (1), d = diffuse (2); distribution scores are additive to lesion severity scores.

Note: Some tissues had more than one lesion, each lesion was scored according to severity and distribution, and these scores were additive for that tissue.

pv = perivascular, pb = peribronchial (peribronchiolar), pl = pleural, pp = periportal

l = lymphocytic, p = plasmacytic, n = neutrophilic, e = eosinophilic, h = histiocytic, gran = granulomatous (granuloma), fib = fibrosing (fibrosis)

ln = lymphoid nodule

ip = interstitial pneumonia

bp = bronchopneumonia

hep = hepatitis

euth hem = euthanasia hemorrhage (artifact of post-capture handling - scored as 0)

hemosid = hemosiderin

fb = foreign body

cocc = coccidia (*Eimeria* or *Isospora*)

crypto = cryptosporidia

flag = flagellated protozoa

cap = capillaria

rhabdo = rhabdomyolysis

mes = mesenteric

adj = adjacent

hyp = hyperplasia (hyperplastic)

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	parathyroid	thymus	adipose	pancreas	salivary	marrow	cartilage	skel msl	bone	lym node
R-A-3-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nls (mes)
R-A-5-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	
R-A-9-1	nos	nos	nls	nls	nos	nos	nos	nls	nos	nls (thorax)
R-A-11-1	nos	nos	nls	nls	nls	nos	nls	rhabdo	nls	nls (thorax)
R-A-18-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (mes)
R-A-19-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nos
R-A-25-1	nls	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	
R-A-26-1	nos	nos	nls	nls	1 f lp	nos	nls	1 rhabdo	nos	
R-A-26-2	nos	nos	nls	nls	nos	nos	nls	1 rhabdo	nos	nls(mes)
R-A-26-3	nos	nos	nls	nls	nls	nls	nls	1 rhabdo, few protozoan cysts	nls	nos
R-A-27-1	nls	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	
R-A-29-1	nos	nos	nls	nls	nos	nos	nls	nls	nos	nls (mes)
R-A-31-1			nls	nls		nls		nls	nls	
R-A-32-1	nos	nls	1 f pv lp adj to adrenal	nls	nls	nos	nls	1 rhabdo	nos	
R-A-36-1	nls	nls	nls	nls	nls	nos	nls	1 rhabdo	nos	
R-A-40-1	nos	nos	1 f schizont adj to thyroid	nls	nls	nls	nls	1 rhabdo	nls	nls(thorax)
R-A-48-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thorax)
R-A-49-1	nos	nos	nls	nos	nls	nos	nos	1 rhabdo	nos	nos
R-A-55-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nos
R-A-56-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nls (adj to trachea)

1 Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	ovary	uterus	placenta	testicle	kidney ¹	other
R-A-3-1						
R-A-5-1						1 mf lp pv adj to esoph, penis nls
R-A-9-1						atrium , skin adj to anus, urethra nls
R-A-11-1						
R-A-18-1						
R-A-19-1						
R-A-25-1						1 f ln mediastinum
R-A-26-1						1 mf pv ln mediastinum adj to lung and esoph, penis, perrectal skin nls
R-A-26-2						1 mf pv lpne adj to stomach, pancreas
R-A-26-3						
R-A-27-1		nls				urinary bladder nls
R-A-29-1						1 f ln adj to trachea, ulcerated perirectal abscess with tract
R-A-31-1		nls				
R-A-32-1						1 f pv lp peritonitis adj to cardia, 1 f lpne pv perianal dermatitis, mammary cellulitis
R-A-36-1		nls				
R-A-40-1						
R-A-48-1						1 f neut mediastinitis, adj to left cranial lung
R-A-49-1					nls	
R-A-55-1						1 f ln mediastinum
R-A-56-1						1 f perianal furnuculosis with microabscess formation

¹ Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	parathyroid	thymus	adipose	pancreas	salivary	marrow	cartilage	skel msl	bone	lym node
R-A-57-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	
R-A-57-2	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (mes)
R-A-62-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	1 mf subcapsular h (mes)
R-B-15-1	nls	nls	nls	nls	nls	nos	nls	1 rhabdo	nos	
R-C-3-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thorax)
R-C-10-1	nos	nos	nls	nls	1 mf lp, ductular intranuclear inclusion, adeno or cytomegalovirus-like	nls	nls	1 rhabdo	nls	nls (thorax)
R-C-14-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	
R-C-20-1	nls	nos	nls	nls	1 f lymph pv	nls	nls	1 rhabdo	nls	
R-C-20-2	nls	nos	nls	nls	1 f pv lpne	nls	nls	1 rhabdo	nls	nls (thorax)
R-D-3-1	nos	nos	1 atrophy	nls	nls	nls	nls	1 rhabdo, 1 mf protozoan cysts	nls	nls (thorax, mes)
R-D-4-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (tracheal, thoracic)
R-D-18-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nls	nls (mes)
R-D-22-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nls (tracheal, mes)
R-D-29-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nls (tracheal)
S-A-2-1	nos	nls	nls	nls	nls	nls	nls	nls	nls	
S-A-3-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo, 1 focal fibrosis	nos	nls (mes)
S-A-4-1	nls	nos	nls	nos	nls	nls	nls	1 rhabdo	nls	

1 Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	ovary	uterus	placenta	testicle	kidney ¹	other
R-A-57-1						fb granuloma (thorn) adj to larynx, 1 mf pv lpn dermatitis adj to anus
R-A-57-2		endometritis/vaginitis with cytomegalovirus-like inclusion				
R-A-62-1						
R-B-15-1					nls	2 mf lpne, 1 mf ln, adjacent to pancreas and stomach; 1 f lp pp adjacent to pancreas and stomach (liver -opportunistic)
R-C-3-1						
R-C-10-1						1 f ln cervical ct
R-C-14-1		nls				
R-C-20-1						
R-C-20-2						1 mf ln with eos, mesentery adj to adrenal, pancreas and stomach
R-D-3-1						
R-D-4-1						1 mf lpne pv, mediastinum adj to lung, cardia
R-D-18-1						1 mf lpne pv, adj to esoph
R-D-22-1						
R-D-29-1						1 mf lp pv adj to esophag
S-A-2-1						1 mf lp pv and focal mineralized microgranuloma, mediastinum adj to lung
S-A-3-1						
S-A-4-1						1 mf lpne pv peritonitis, adj to stomach

¹ Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	parathyroid	thymus	adipose	pancreas	salivary	marrow	cartilage	skel msl	bone	lym node
S-A-4-2	nls	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thoracic, mes)
S-A-5-1	nos	nos	nls	nos	nls	nos	nls	1 rhabdo	nos	
S-A-5-2	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	
S-A-6-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	
S-A-9-1	nls	nls	nls	nls	focal fb gran (plant or hair), focal bilateral periductal fibrosis, squamous metaplasia	nls	nls	1 rhabdo	nls	3 plasma cell, thoracic nls (mes)
S-A-11-1	nos	nos	nls	nos	nls	nls	nls	1 f gran myositis	nls	
S-A-12-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thoracic)
S-A-17-1	nls	nos	nls	nls	nls	1 myeloid hyp	nls	1 rhabdo	nls	nls (mes)
S-A-19-1	nls	nls	nls	nls	nls	nls	nls	1 rhabdo, 1 mf sarcocystis cysts	nls	
S-A-21-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thoracic, mes)
S-A-29-1	nls	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thoracic)
S-A-31-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	
S-B-1-1	nls	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thorax, mes)
S-B-6-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thorax)
S-B-28-1	nos	nls	nls	nls	nls	nos	nls	1 rhabdo	nos	
S-B-33-1	nos	nos	nls	nls	nls	nos	nls	nls	nos	
S-B-35-1	nos	nos	nls	nls	nls	nls	nls	nls	nls	
S-C-7-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nls	
S-C-9-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	suppurative lymphadenitis adj to trachea

1 Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	ovary	uterus	placenta	testicle	kidney ¹	other
S-A-4-2						1 mf lp pv mediastinum, possible intracytoplasmic zoites
S-A-5-1						1 mf lp pv mediastinum
S-A-5-2						1 mf lpne pv adj to cardia
S-A-6-1						
S-A-9-1						2 f pv ln med adj to esoph, 3 mf lp mediastinum, 2 f pv lpne adj to colon and rectum
S-A-11-1		nls				1 f follicular acariasis (demodex) perirectal skin, perirectal scarring, 1 mf lymph pv peritonitis (adj to stomach)
S-A-12-1						
S-A-17-1						
S-A-19-1		nls				1-2 mf lpne pv adj to cardia
S-A-21-1						
S-A-29-1						
S-A-31-1						atrium nls
S-B-1-1						
S-B-6-1						
S-B-28-1						
S-B-33-1						1 f lp gran peritonitis with mineralization, adj to adrenal
S-B-35-1						
S-C-7-1						1 mf gran adj to adrenal, 1 f gran cellulitis and scarring adj to anus
S-C-9-1					nls	1 f scarring adj to cardia

¹ Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	parathyroid	thymus	adipose	pancreas	salivary	marrow	cartilage	skel msl	bone	lym node
S-C-11-1	nls	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	
S-C-16-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	
S-D-1-1	nos	nls	nls	nls	nls	nos	nls	1 rhabdo, 1 mf protozoan cysts, 1 f lp myositis	nos	nls, thorax, mes
S-D-4-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	
S-D-7-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	
S-D-10-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	
S-D-11-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls
S-D-18-1	nos	nos	1 mf pv lp(adj to adrenal and larynx)	nls	nls	nls	nls	1 rhabdo	nls	
S-D-19-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (thoracic)
S-E-12-1	nos	nls	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (mes, thoracic)
S-E-18-1	nos	nos	nls	nls	nls	nos	nls	1 rhabdo	nos	nls (tracheal)
S-F-1-1	nls	nos	nls	nls	nls	hyperplasia (left shift in eosinophil line)	nls	1 rhabdo	nls	
S-F-2-1	nls	nos	nls	nls	nls	1 eos hyp	nls	1 rhabdo	nls	nls (mes)
S-F-3-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	
S-F-15-1	nos	nos	nls	nls	1-2 mf lpne	nos	nls	1 rhabdo	nos	
S-F-16-1	nos	nos	nls	nls	nls	nls	nls	1 rhabdo	nls	nls (tracheal)

1 Adjacent to adrenal (Opportunistic tissue).

Appendix 2. Ancillary histologic lesions in deer mice (*Peromyscus maniculatus*) from Libby Superfund Site.

Mouse #	ovary	uterus	placenta	testicle	kidney ¹	other
S-C-11-1		nls				1 mf lpn pv adj to cardia
S-C-16-1						
S-D-1-1						1 mf lp pv adj to esophag
S-D-4-1						
S-D-7-1						1 f lpne pv adj to esoph
S-D-10-1						
S-D-11-1						2 mf lpne pv mesenteritis adj to cardia, atrium nls
S-D-18-1						
S-D-19-1						
S-E-12-1						2 f ln adj to cardia
S-E-18-1						1 f pv ln mediastinum, 1 mf capillaria ova granulomas adj to adrenal
S-F-1-1						1-2 f pv lpne adj to esophagus, trachea, adrenal (nematode ova), intracytoplasmic protozoan zoites in macrophages (esophagus), nematode ova gran adj to rectum
S-F-2-1						1 f pv ln adj to layrnx
S-F-3-1						2 f lpne pv peritonitis adj to cardia
S-F-15-1						1 mf lpne pv adj to trachea
S-F-16-1						3 f lpne mesenteritis adj to cardia

¹ Adjacent to adrenal (Opportunistic tissue).

ATTACHMENT I
NORTHWEST ZOOPATH RESPONSE TO USEPA COMMENTS

Addendum to Histopathology Report

Libby superfund study

August 2010

This addendum addresses concerns raised by EPA reviewers as stated below:

Appendix I

COMMENT: Please include a more complete text description of the nature of the histologic lesions seen in larynx and left mainstem bronchus.

RESPONSE: There were no histologic changes in the larynx or left mainstem bronchus that differed from those seen in other portions of the respiratory tract. If there is a statistical difference regarding the lesions in these locations for control and study site mice, it cannot be explained histologically. The morphologic features of each lesion in each tissue, regarding type of lesions, cellular infiltrate, and severity, are listed in Appendix 1 in the original Northwest ZooPath report I prepared. The overview regarding respiratory lesions is also in the original report and is as follows:

“Inflammation in the upper respiratory tract was largely confined to the submucosa, and mostly lymphoplasmacytic, with occasional neutrophils and eosinophils. Perivascular cuffing was the most prevalent form of inflammation in the lungs, followed by peribronchiolar cuffing, lymphonodular hyperplasia and interstitial pneumonia, respectively. Inflammation was mostly lymphoplasmacytic with occasional neutrophils, eosinophils or histiocytes. Perivascular cuffing was distributed fairly evenly throughout the left and right lobes. Peribronchiolar cuffing was more prevalent in the caudal lungs than in the cranial lungs. Lymphonodular hyperplasia was present throughout the respiratory tract and no discernable pattern was apparent, except for a somewhat higher prevalence on the pleural surfaces of the right caudal and post caval lobes than in other lobes.”

COMMENT: For the four lesions that were assigned a pathos factor of 2, please provide more detailed discussion as to why these were not considered to be caused by asbestos.

RESPONSE: In the introduction to my original report (Appendix I of the Small Mammal Report) I summarized the respiratory lesions that are known to be caused by asbestos as reported in the scientific literature:

“Pathologic changes in the lungs following aerosol exposure in rodents include epithelial hypertrophy and proliferation, alveolar macrophage infiltrates, pleural effusion, interstitial and pleural fibrosis, and development of bronchogenic carcinoma or mesothelioma.^{4,11,19,21”}

In addition to the specific lesions listed in Appendix 1 of my original report for these 4 mice, the overview of histologic lesions in the report states:

"Syncytia, multinucleated cells likely of epithelial origin, were noted in very low numbers within alveolar lumina of few mice. Pleural inflammation, primarily lymphoplasmacytic infiltrates, was seen in few mice. Few small foci of fibrosis were seen in the pleura of few mice, one of which was associated with some mild mesothelial cell hypertrophy. No asbestos fibers were seen by light microscopy."

In the discussion regarding the histologic findings, the initial report states:

"The principal tissue reactions associated with exposure to asbestos occur in the respiratory tract and include peribronchiolar macrophage and multinucleated cell infiltrates, fibroblast activation and collagen deposition resulting in interstitial and pleural fibrosis, bronchial and mesothelial cell hypertrophy and hyperplasia, bronchogenic carcinoma and mesothelioma.^{2,4,11,19,21} Asbestos fibers can be seen histologically in macrophages, multinucleate giant cells and in the alveolar and pleural interstitium.^{5,11,12,19,20,26} Histologic patterns typical of asbestos exposure were not seen in these mice, and no asbestos fibers were seen histologically in any of the mice....."

"Pleural lesions were seen in few of the mice, including inflammation, some mild focal fibrosis or adhesions, and mild focal mesothelial cell hypertrophy in one mouse. These lesions were attributed to parasitism. It is considered unlikely that the fibrosis was due to asbestosis, since the inflammatory changes were similar to those seen in other tissues. Pleural fibrosis due to asbestos exposure is accompanied by interstitial fibrosis (asbestosis),^{4,5} and no interstitial fibrosis was noted. Also, no asbestos fibers were noted histologically in the pleural lesions."

Individual tissues in the mammalian body are highly specialized structures, and they have only a limited number of ways to respond to any single disease process. There are very few diseases in nature that cause one specific tissue change that is diagnostic (pathognomonic) for that disease. Therefore, it is a spectrum of lesions that is documented for specific disease processes that aid in their diagnosis. Because many of the tissue reactions that occur with various disease processes tend to overlap, such as fibrosis or the formation of multinucleated cells (syncytia), the entire spectrum of lesions and their patterns in the tissue must be considered in proper context. It is my professional opinion that there is not an adequate spectrum of lesions or lesion patterns in these mice to document exposure to asbestos, and there is adequate evidence to attribute all disease processes in these mice to other causes. However, a pathos factor was included to address those lesions that overlap some of the lesions seen with asbestos.

COMMENT: Please provide an explanation for why some fibrotic lung lesions were assigned a pathos factor of 2, and why some were not.

RESPONSE: I am not sure specifically which mice this comment pertains to. Some mice had pleural adhesions that are typically seen at the apex of the lung lobe of old mammals, a form of fibrosis associated with friction. It is considered an incidental finding and would not likely be assigned a pathos factor, but because it was there I included it in my report. Regarding pleural fibrosis and pathos, I tried to use this only when fibrosis was related to active disease processes, all of which in my opinion were due to parasite migration or foreign body migration.

COMMENT: Please add text that describes the ability of the microscopic methods used to observe asbestos fibers of specific diameters and lengths, if they were present (this will help provide context for interpreting the observation that no fibers were detected).

RESPONSE: In the introduction to my original report (Appendix I of the Small Mammal Report) it is stated and referenced:

“Experimental studies characterizing the pathologic affects of asbestos exposure in rodents have been documented. Pathologic changes in rodents occur following oral and inhalation exposure and parallel those seen in humans.^{5,11,12} In rodents and primates, asbestos-induced lesions are dependent on dose, fiber type and fiber length.^{4,6,11,16, 19,26}”

and in the discussion of my original report it is stated and referenced:

“Asbestos fibers can be seen histologically in macrophages, multinucleate giant cells and in the alveolar and pleural interstitium.^{5,11,12,19,20,26}”

Light microscopy, which I used, can resolve structures to approximately 1 micron in diameter. Asbestos fibers have varying configurations, but for the most part, the individual fibril component structure is spindle or spicule-shaped. Fibril size is variable as well and the diameter of some is beyond the level of the light microscope, or requires specialized microscopic techniques or microscopes to illustrate. Some asbestos fibers are refractile and birefringent, and some are not. Ancillary techniques using specialized microscopy, lung wash, and electron microscopy have been used to further determine the presence of asbestos in tissues. These procedures were beyond the scope of the study. It should be noted that aside from the absence of asbestos fibers in histologic sections in these mice, there also was no evidence of other forms of pneumoconiosis.

COMMENT: Please expand the description of the general health status of the mice, and provide a discussion of the potential impacts (if any) of the observed lesions on growth, reproduction and survival of the mice.

RESPONSE: Although a broad spectrum of lesions were seen in various tissues of these mice, most of these lesions were mild, and attributed to parasitism. Parasite-host interactions evolve over time, and successful interactions beneficial to both species do not result in serious disease or death of either. Therefore, it was not surprising or unexpected that these mice, indigenous to their collection sites, were heavily parasitized but were in otherwise good health. All mice had recognizable or exuberant fat stores, indicative of adequate nutritional status. None of the mice had evidence of a prominent stress response in the lymphoid tissues or adrenals, and none of the mice had morphologic evidence of immune suppression or dysfunction, the latter based on morphologic features of the various lymphoid tissues (spleen, lymph node and thymus). The immune response (inflammation) in the tissues of the mice also supports a functional immune system that was able to contain the affects of parasite migration and foreign body insults. Although the true age of these mice was not known, they appeared to be adults and some had obvious age-related changes such as fibrosis. I would consider it unlikely that the lesions observed in the examined tissues would significantly alter general health status, growth or survival of the mice. The reproductive tracts were only examined opportunistically in these mice, and only a few female tracts were present, so evaluation was probably not statistically significant. These findings are listed in Appendix 2. It should be noted that all but one were histologically within normal limits. I consider it unlikely that these mice had compromised reproductive ability for any reason.

APPENDIX J1

***PEROMYSCUS* EYE LENS WEIGHT DETERMINATION
STANDARD OPERATING PROCEDURE**

Peromyscus Eye Lens Weight Determination**PERL SOP No.: 5330****Revision No: 0****Effective: 01/2010****Approved: Allison Cardwell****1.0 PURPOSE AND APPLICABILITY**

This procedure provides the basic methodology for determination of dry weights of the lens of an eye, as discussed in Lord (1959).

2.0 DEFINITIONS

Tare weight: the weight of any empty weight boat

Wet Weight: the weight of the weigh boat plus the eye lens shortly after removal from the eye.

Stabilized gross weight: the weight of the weight boat plus the eye lens after drying to a point of stabilized weight.

Net Weight: Stabilized gross weight minus tare weight (plus any blank adjustment).

3.0 HEALTH AND SAFETY CONSIDERATIONS

Heat resistant gloves must be worn when using the oven. Skin or clothing should never come into contact with a hot oven.

4.0 QUALITY ASSURANCE PLANNING CONSIDERATIONS

No study-specific variances from this SOP are anticipated.

5.0 RESPONSIBILITIES

All individuals performing this procedure must understand and follow this SOP.

6.0 TRAINING/QUALIFICATIONS

The technician conducting this procedure should be trained by a qualified person, and must fully understand these SOP requirements and the recording of data on the Remedium Project Weighing Form. They must also be proficient in PERL SOP No. 5002, Calibration of A&D ER-182A Analytical Balance.

7.0 REQUIRED MATERIALS

The following materials are necessary for this procedure:

- Drying oven
- Heat resistant gloves
- Long handled tongs
- Aluminum weigh boats
- Sharpie pen, or equivalent (permanent ink)
- Desiccator with good desiccant (see PERL SOP No. 5016)
- A&D ER-182A Analytical Balance with accuracy to 0.01 mg, calibrated according to PERL SOP No. 5002 on each of the days of use
- Remedium Project Weighing Form

8.0 METHODS

8.1 Wet and Dry Weight Determination

- 1) Mark each weigh boat using a sharpie with a number (1,2,3,4,etc.), in order, beginning first with all the control samples followed by all the asbestos site samples. After all eye lens weigh boats are labeled, take 5 additional weigh boats and label these with a letter for blank measurements (i.e., A, B, C). Record the number used to mark each boat (sample or blank) on the Remedium Project Weighing Form and record the corresponding information (sample number or blank) so that the appropriate information can be identified from the boat number.
- 2) Pre-dry the weigh boats in the drying oven at 95° C for at least 2 hours. Cool the boats in a desiccator for at least 30 minutes and obtain tare weights to the nearest 0.01 mg. For each weigh boat, record the weight in the appropriate row of the tare weight column on the Remedium Project Weighing Form. The pre-weighed boats will be transferred back into the drying oven until use. Prior to use for wet/dry weights, the boats will be placed in the desiccator for at least 30 minutes prior to weighing.
- 3) Each eye lens (two per mouse for a total of 144 over 72 mice) will be transferred to a marked, pre-weighed weighing boat and a wet weight recorded on Remedium Project Weighing Form. The weigh boat will then be placed in the drying oven, which is set at 95° C. Eye lenses are considered "dry" when they reach a constant weight; usually in about 96 hours. Fifteen percent (23 total) of the eye lenses will be randomly selected from locations throughout the drying oven to check for weight stability at 24 hours (i.e., from the time the last weigh boat was placed in the oven) along with at least one blank. Weights for these 23 boats and the blank weigh boats will be checked every 24 hours and weights recorded on the Remedium Project Weighing Form as outlined in the steps below, until a stable weight is achieved for each of the 23 boats. If any of the boats continue to have weight fluctuations, they

will all be placed back into the oven for another 24 hours and these steps repeated until a stable weight is achieved. At that time all the boats will be considered at stable weight and the final weighing and recording will begin according to the procedures in steps 4 and 5 below.

- 4) Immediately upon removal from the oven, the weigh boats are placed in a desiccator to prevent absorption of moisture from the air until cool. When ready to weigh, remove the weigh boats in small batches up to 10 at a time and weigh to the nearest 0.01 mg. The weigh boats serving as blanks should be weighed first (see step 5 below for instructions regarding weight gain in the blank). For each weigh boat, record the weight in the appropriate row of the stabilized gross weight column on Remedium Project Weighing Form.
- 5) Adjustments to weights based on blank weight differences will be made in an Excel spreadsheet and not on the raw Remedium Project Weighing Form. If the blank has lost weight, the amount of loss to each of the stabilized gross weights will be adjusted to obtain the adjusted net weight. If the blank has gained more than 0.00003 g, the desiccant used should be checked for dryness, and replaced if needed, and all weigh boats should then be re-dried and cooled prior to determination of stabilized gross weights. If the blank weight after re-drying and cooling is still more than 0.00003 g heavier than its tare weight, it may be assumed that either an error occurred in recording the blank tare weight or the blank weigh boat was somehow contaminated after taring. In this case, stabilized gross weights may be determined for the remaining weigh boats and there will be no adjustments to the net weights.

9.0 QUALITY CONTROL CHECKS AND ACCEPTANCE CRITERIA

The daily calibration of the analytical balance must be done according to PERL SOP No. 5002 prior to using the balance for weight determinations. The technician conducting the analysis should make sure that the numbers are reasonable (e.g., gross weights are larger than tare weights) **PRIOR TO DISPOSAL OF THE DRIED BOATS**. If the blank has gained more than 0.00003 g, the desiccant used should be checked for dryness, replaced if needed, and all weigh boats should be re-dried and cooled prior to weighing.

10.0 DOCUMENTATION

Weight data, as described in this SOP, will be recorded on Remedium Project Weighing Form. Any adjustments to weights based upon blank weight adjustment procedures will be done in an Excel spreadsheet and calculations will not be made on the Remedium Project Weighing Form.

11.0 REFERENCES

Lord, R.D., Jr. 1959. The lens as an indicator of age in cottontail rabbits. *Journal of Wildlife Management* 23 (3): 358-360.

APPENDIX J2

***PEROMYSCUS* EYE LENS WEIGHT RAW DATA SHEETS**

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>301</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 @ 1227 TH</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 0920 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1000</u> to Date: <u>1/26/10</u> Time: <u>1410</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 @ 1535 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1510</u> <u>1/23/10 @ 1540 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1530</u> <u>1/24/10 @ 1610 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1510</u> <u>1/25/10 @ 1540 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/26/10 1535 TH</u>	Comments <u>out of oven 1230</u> <u>1/26/10 1330 TH</u>
1	SMRA311A	1.31457	1.33671	① 1.32584	1.32565	1.32556	1.32550		① out of oven 1/22/10 @ 1500 1.32557
2	SMRA311B	1.31680	1.33972	1.321②				1.3288③ 12	
3	SMRA571A	1.31755	1.33600					1.32681	
4	SMRA571B	1.32786	1.34679					1.33727	
5	SMSE121A	1.31263	1.33023					1.32108	
6	SMSE121B	1.31454	1.32580					1.32124	SMSE121B peeling
7	SMSE151A	1.30629	1.32081					1.31378	
8	SMSE151B	1.31318	1.32974	① 1.32139	1.32118	1.32113	1.32116		1.32114
9	SMSE181A	1.32760	1.35023					1.33895	
10	SMSE181B	1.32361	1.34656					1.33493	
11	SMRC202A	1.32226	1.33848					1.33007	
12	SMRC202B	1.33142	1.34736					1.33904	
13	SMSD11A	1.32261	1.33813					1.33088	
14	SMSD11B	1.32845	1.34797					1.33763	
15	SMSC91A	1.32796	1.34581	① 1.33683	1.33664	1.33664	1.33658		1.33665
16	SMSC91B	1.32786	1.34452					1.33616	
17	SMRC201A	1.32486	1.34630 1.34550					1.33589	

① TH 1/21/10 E ② TH 1/26/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>B01</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 1235 TL</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 1000 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1025</u> to Date: <u>1/26/10</u> Time: <u>1410</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 @ 1435 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1510 1/23/10 @ 1540 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1530 1/24/10 1610 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1510 1/25/10 1540 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/26/10 1550 TH</u>	Comments <u>out of oven 1230 1/26/10 1330 TH</u>
18	SMRC201B	1.32417	1.34662					1.33518	
19	SMRA561A	1.33151	1.34576					1.33807	
20	SMRA561B	1.31632	1.33090					1.32289	
21	SMRD41A	1.31685	1.33233					1.32357	
22	SMRD41B	1.32697	1.34190	① 1.33382	1.33373	1.33372	1.33376		1.33372
23	SMRC101A	1.33706	1.35802					1.34697	
24	SMRC101B	1.32028	1.34114					1.33012	
25	SMSA51A	1.33836	1.35948					1.34836	
26	SMSA51B	1.32086	1.34142					1.33079	
27	SMRD181A	1.30857	1.32313					1.31518	
28	^{D181} SMRA91B	1.32781	1.34188					1.33447	
29	SMRA91A	1.31750	1.33231	① 1.32439	1.32417	1.32411	1.32408		1.32409
30	SMRA91B	1.33411	1.34866					1.34070	
31	SMRC141A	1.32137	1.34143					1.33111	
32	SMRC141B	1.33382	1.35452					1.34392	
33	SMSA41A	1.32092	1.33880					1.32931	
34	SMSA41B	1.32377	1.34139					1.33218	

① TH 1/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>301</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 TH @ 1245</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 TH @ 1029</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1055</u> to Date: <u>1/27/10</u> Time: <u>0840</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 @ 1535 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1510 1/23/10 @ 1515 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1530 1/24/10 1610 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1510 1/25/10 1550 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/27/10 0930 TH</u>	Comments <u>out of oven 1230 1/26/10 1335 TH</u>
35	SMRD221A	1.32462	1.34071					1.33246	
36	SMRD221B	1.33118	1.34807	1.33955	1.33920	1.33917	1.33920		1.33922
37	SMSF31A	1.32132	1.33993					1.33032	
38	SMSF31B	1.32547	1.34412					1.33458	
39	SMRA361A	1.33811	1.36038					1.34907	
40	SMRA361B	1.32589	1.34805					1.33663	
41	SMRA572A	1.33542	1.36198					1.34874	
42	SMRA572B	1.32128	1.34707					1.33402	
43	SMSD181A	1.31227	1.32763					1.31902	
44	SMSD181B	1.32396	1.33892					1.33072	
45	SMSB281A	1.32735	1.34389	1.33524	1.33495	1.33494	1.33496		1.335497
46	SMSB281B	1.32240	1.33852					1.33000	
47	SMRA551A	1.34495	1.36030					1.35181	
48	SMRA551B	1.32096	1.33498					1.32726	
49	SMRA262A	1.33008	1.34366					1.33615	
50	SMRA262B	1.33438	1.34780					1.34036	
51	SMRA481A	1.32335	1.34621					1.33474	

① TH 1/26/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: B01	
Date/Time/Analyst of Tare Wt.: 1/20/10 1255 TH				Date/Time/Analyst of Wet Wt.: 1/21/10 @1100 TH				Dried in Oven # 1 @ 95 °C from Date: 1/21/10 Time: 1115 to Date: 1/27/10 Time: 0840	
Date/Time/Analyst of Check Wt. (24 hrs): 1/22/10 0153 TH				Date/Time/Analyst of Check Wt. (48 hrs): out of oven 1510 1/23/10 1545 TH					
Date/Time/Analyst of Check Wt. (72 hrs): out of oven 1530 1/24/10 1615 TH				Date/Time/Analyst of Check Wt. (96 hrs): out of oven 1510 1/25/10 1550 TH					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: 1/27/10 0945 TH	Comments out of oven 1230 1/26/10 1335 TH
52	SMRA 481 B	1.33074	1.35312					1.34178	
53	SMRA 181 A	1.31892	1.33225 1.32605					1.32477	
54	SMRA 181 B	1.32901	1.34187	1.33480	1.33458	1.33461	1.33464		1.33465
55	SMRD 291 A	1.31283	1.32997					1.32099	
56	SMRD 291 B	1.30852	1.32607					1.31667	
57	SMRA 251 A	1.32004	1.33356					1.32600	
58	SMRA 251 B	1.31751	1.33096					1.32338	
59	SMRA 261 A	1.32890	1.34215	1.33477	1.33460	1.33465	1.33457		1.33459
60	SMRA 261 B	1.33130	1.34424					1.33707	
61	SMRA 263 A	1.33098	1.35572					1.34307	
62	SMRA 263 B	1.33412	1.35894					1.34648	
63	SMRD 31 A	1.32267	1.34309					1.33334	
64	SMRD 31 B	1.33950	1.36106	1.35057	1.35027	1.35024	1.35025		1.35027
65	SMRA 291 A	1.32835	1.35001					1.33908	
66	SMRA 291 B	1.33244	1.35463					1.34323	
67	SMRA 31 A	1.314097	1.32577					1.31759	
68	SMRA 31 B	1.32297	1.33749					1.32963	

① TH 1/10 E

② TH 1/22/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>1301</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 1305 TH</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 1100 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1400</u> to Date: <u>1/27/10</u> Time: <u>0840</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 1550 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1/23/10 1545 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1/24/10 1615 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1/25/10 1550 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/27/10 1000 TH</u>	Comments <u>out of oven 1/26/10 1340 TH</u>
69	SMRA 5-1 A	1.33427	1.34846	① 1.34083	1.34073	1.34069	1.34070		1.34072
70	SMRA 51 B	1.32489	1.33881					1.33135	
71	SMRB 151 A	1.32623	1.34483					1.33513	
72	SMRB 151 B	1.32346	1.34194					1.33258	
73	SMRA 491 A	1.32641	1.34952					1.33755	
74	SMRA 491 B	1.34329	1.36641	① 1.35510	1.35485	1.35480	1.35471		1.35469
75	SMSF 21 A	1.32218	1.33855					1.33 ^③ 2985	
76	SMSF 21 B	1.32833	1.34491					1.33610	
77	SMSA 111 A	1.32448	1.34372					1.33367	
78	SMSA 111 B	1.32110	1.34041					1.33036	
79	SMSB 61 A	1.32441	1.34163	① 1.33244	1.33229	1.33219	1.33224		1.33218
80	SMSB 61 B	1.32349	1.33960					1.33119	
81	SMSD 41 A	1.32380	1.34080					1.33129	
82	SMSD 41 B	1.31424	1.33148					1.32168	
83	SMSD 101 A	1.32239	1.33837					1.32991	
84	SMSD 101 B	1.32731	1.34372					1.33495	
85	SMSRA 271 A	1.31867	1.33461					1.32601	

MT 1/21/10 @ 1100 TH 1/22/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>1301</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 1400 TH</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 1300 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1430</u> to Date: <u>1/27/10</u> Time: <u>1015</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 @ 1530 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1510 1/23/10 1550 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1530 1/24/10 1620 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1510 1/25/10 1600 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/27/10 1105 TH</u>	Comments <u>out of oven 1230 1/26/10 1345 TH</u>
86	SMRA271B	1.33028	1.34658					1.33771	
87	SM5A52A	1.31857	1.33859	① 1.32837	1.32816	1.32806	1.32797		1.32796
88	B	1.33812	1.35811					1.34779	
89	SM5D111A	1.33380	1.35298					1.34311	
90	B	1.33112	1.35026					1.34049	
91	SM5A291A	1.32050	1.33972					1.32893	
92	B	1.32406	1.34255					1.33262	
93	SMRA401A	1.33137	1.34810	① 1.33921	1.33913	1.33908	1.33897		1.33900
94	B	1.31374	1.33034					1.32139	
95	SM5A31A	1.33054	1.34648					1.33768	
96	B	1.31123	1.32733					1.31828	
97	SMRA621A	1.31020	1.33103	① 1.32076	1.32065	1.32060	1.32049		1.32046
98	B	1.31791	1.34044					1.32873	
99	SM5A121A	1.32446	1.34193					1.33231	
100	B	1.31754	1.33549					1.32538	
101	SM5A171A	1.31919	1.33828	① 1.32827	1.32818	1.32820	1.32819		1.32813
102	B	1.35087	1.37021					1.35986	

① T 1/22/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>1301</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 1415 TH</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 1330 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1455</u> to Date: <u>1/27/10</u> Time: <u>1015</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 1530 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>out of oven 1510 1/23/10 @ 1550 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>out of oven 1530 1/24/10 1620 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>out of oven 1510 1/25/10 1600 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/27/10 1120 TH</u>	Comments <u>out of oven 1230 1/26/10 1345 TH</u>
103	SMSA 61 A	1.32824	1.34382					1.33524	
104	B	1.33266	1.34728					1.33942	
105	SMSA 311 A	1.33082	1.34581					1.33771	
106	B	1.32879	1.34385					1.33565	
107	SMRA 191 A	1.31332	1.32580					1.31855	
108	B	1.31071	1.32319					1.31607	
109	SMSB 11 A	1.32621	1.34829					1.33389	
110	B	1.31920	1.33575	① 1.32680	1.32669	1.32668	1.32672		1.32669
111	SMSB 331 A	1.32257	1.34542					1.33373	
112	B	1.32957	1.35278					1.34068	
113	SMSB 351 A	1.32520	1.34209					1.33313	
114	B	1.32887	1.34647	① 1.33685	② 1.33685	1.33665	1.33673		1.33666
115	SMSF 161 A	1.33212	1.34978					1.34030	
116	B	1.32453	1.34049					1.33234	
117	SMRA 321 A	1.33214	1.34562					1.34256	
118	B	1.32688	1.34807	① 1.33740	1.33728	1.33719	1.33720		1.33719
119	SMSD 71 A	1.33483	1.35806					1.34617	

① TH 1/21/10 E ② TH 1/23/10 E

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: B0	
Date/Time/Analyst of Tare Wt.: 1/20/10 1425 TH				Date/Time/Analyst of Wet Wt.: 1/21/10 @ 1400 TH				Dried in Oven # 1 @ 95°C from Date: 1/21/10 Time: 1915 to Date: 1/27/10 Time: 1025	
Date/Time/Analyst of Check Wt. (24 hrs): 1/22/10 1530 TH				Date/Time/Analyst of Check Wt. (48 hrs): out of oven 1510 1/23/10 1550 TH					
Date/Time/Analyst of Check Wt. (72 hrs): out of oven 1530 1/24/10 1625 TH				Date/Time/Analyst of Check Wt. (96 hrs): out of oven 1570 1/25/10 1610 TH					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: 1/27/10 1140 TH	Comments out of oven 1230 1/26/10 1445 TH
120	SM5D T1 B	1.33601	1.35959				1.347②	1.34727	
121	SM5C T1 A	1.32761	1.34069					1.33340	
122	SM5C T1 B	1.33103	1.34312					1.33657	
123	SM5A 21 A	1.32968 ⁷²	1.34545					1.33675	
124	SM5A 21 B	1.33321	1.34888 ⁹⁰					1.34025	
125	SMRC 31 A	1.31928	1.33445					1.32639	
126	SMRC 31 B	1.34610	1.36079					1.35301	
127	SM5A 42 A	1.32132	1.334032 ^①	1.33058	1.33032	1.33032	1.33026		1.33026
128	SM5A 42 B	1.32198	1.34107					1.33096	
129	SM5C 111 A	1.31656	1.33465					1.32494	
130	SM5C 111 B	1.32367	1.34191					1.33196	
131	SM5C 161 A	1.32664	1.34326 ^①	1.33460	1.33436	1.33440	1.33443		1.33447
132	SM5C 161 B	1.32129	1.33809					1.32906	
133	SM5F 11 A	1.31281	1.33574					1.32411	
134	SM5F 11 B	1.32279	1.34629					1.33432	
135	SM5A 191 A	1.31248	1.33634					1.32397	
136	SM5A 191 B	1.31506	1.33830					1.32661	

① TH 2/10 E ② TH 1/27/10 WP ③ TH 1/27/10 F

PEROMYSCUS EYE LENS WEIGHT DATA

Project Number:				Comments:				Analytical Balance ID: <u>P30</u>	
Date/Time/Analyst of Tare Wt.: <u>1/20/10 1305 TH</u>				Date/Time/Analyst of Wet Wt.: <u>1/21/10 @ 1445 TH</u>				Dried in Oven # <u>1</u> @ <u>95</u> °C from Date: <u>1/21/10</u> Time: <u>1530</u> to Date: <u>1/27/10</u> Time: <u>1025</u>	
Date/Time/Analyst of Check Wt. (24 hrs): <u>1/22/10 1530 TH</u>				Date/Time/Analyst of Check Wt. (48 hrs): <u>1/23/10 1550 TH</u>					
Date/Time/Analyst of Check Wt. (72 hrs): <u>1/24/10 1625 TH</u>				Date/Time/Analyst of Check Wt. (96 hrs): <u>1/25/10 1610 TH</u>					
Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Check Gross Weight (g) 24 hours	Check Gross Weight (g) 48 hours	Check Gross Weight (g) 72 hours	Check Gross Weight (g) 96 hours	Stabilized Gross Weight (g) Date/Time/Analyst: <u>1/27/10 1155 TH</u>	Comments <u>Out of the oven 1230 + 1450</u> <u>1/26/10 1330 TH</u>
137	SMRA 11 A	1.31408	1.33668					1.32481	
138	SMRA 11 B	1.31842	1.34064					1.32935	
139	SMSA 91 A	1.31516	1.33236					1.32308	
140	SMSA 91 B	1.31593	1.33273					1.32367	
141	SMSA 211 A	1.30847	1.32667					1.31680	
142	SMSA 211 B	1.30696	1.32594	① 1.31546	1.31526	1.31528	1.31526		1.31528
143	SMSD 191 A	1.33405	1.35024					1.34137	
144	SMSD 191 B	1.34047	1.35791					1.34790	
145		1.31706							
146		1.32242							
147		1.33235							
148		1.33086							
BlankA		1.31684	1.31616	1.31607	1.31599	1.31602	1.31598	③ 1.31616	1.31604
BlankB		1.33889	1.33889					1.33891	1/26/10 1555 TH
BlankC		1.31560	1.31554					1.31553	1/27/10 0945 TH
BlankD		1.33788	1.33786					1.33791	1/27/10 1005 TH
BlankE		1.32565	1.32568					1.32566	1/27/10 1135 TH

① TH 1/20/10 E (3) TH 1/22/10 WP

PEROMYSCUS EYE LENS WEIGHT DATA

[illegible]

APPENDIX J3
MOUSE LENS WEIGHT DATA

Appendix J3
Mouse Lens Weight Data with Age Calculations

Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Stabilized Dried Gross Weight (g)	Check Gross Weight (g) 24 Hours	Check Gross Weight (g) 48 Hours	Check Gross Weight (g) 72 Hours	Check Gross Weight (g) 96 Hours	Lens Wet Weight (g)	Lens Stabilized Dried Weight (g)	Adjusted Dried Lens Weight (g)	Age, Using Adjusted Dried Lens Weight (d)
1	SMRA311 A	1.31457	1.33671	1.32557	1.32584	1.32565	1.32556	1.32550	0.02214	0.01100	0.01102	314
2	SMRA311 B	1.31680	1.33972	1.32812					0.02292	0.01132	0.01134	350
3	SMRA571 A	1.31755	1.33600	1.32681					0.01845	0.00926	0.00928	175
4	SMRA571 B	1.32786	1.34679	1.33727					0.01893	0.00941	0.00943	184
5	SMSE121 A	1.31263	1.33023	1.32108					0.01760	0.00845	0.00847	134
6	SMSE121 B	1.31454	1.32580	1.32124					0.01126	0.00670	0.00672	74
7	SMSF151 A	1.30629	1.32081	1.31378					0.01452	0.00749	0.00751	97
8	SMSF151B	1.31318	1.32974	1.32114	1.32139	1.32118	1.32113	1.32116	0.01656	0.00796	0.00798	113
9	SMSE181 A	1.32760	1.35023	1.33895					0.02263	0.01135	0.01137	353
10	SMSE181 B	1.32361	1.34656	1.33493					0.02295	0.01132	0.01134	350
11	SMRC202 A	1.32226	1.33848	1.33007					0.01622	0.00781	0.00783	108
12	SMRC202 B	1.33142	1.34736	1.33904					0.01594	0.00762	0.00764	101
13	SMSD11 A	1.32261	1.33813	1.33088					0.01552	0.00827	0.00829	126
14	SMSD11 B	1.32845	1.34797	1.33763					0.01952	0.00918	0.00920	171
15	SMSC91 A	1.32796	1.34581	1.33665	1.33683	1.33664	1.33664	1.33658	0.01785	0.00869	0.00871	145
16	SMSC91 B	1.32786	1.34452	1.33616					0.01666	0.00830	0.00832	127
17	SMRC201 A	1.32486	1.34630	1.33589					0.02144	0.01103	0.01105	317
18	SMRC201 B	1.32417	1.34662	1.33518					0.02245	0.01101	0.01103	315
19	SMRA561 A	1.33151	1.34576	1.33807					0.01425	0.00656	0.00658	71
20	SMRA561 B	1.31632	1.33090	1.32289					0.01458	0.00657	0.00659	71
21	SMRD41 A	1.31685	1.33233	1.32357					0.01548	0.00672	0.00674	75
22	SMRD41 B	1.32697	1.34190	1.33372	1.33382	1.33373	1.33372	1.33376	0.01493	0.00675	0.00677	76
23	SMRC101 A	1.33706	1.35802	1.34697					0.02096	0.00991	0.00993	218
24	SMRC101 B	1.32028	1.34114	1.33012					0.02086	0.00984	0.00986	213
25	SMSA51 A	1.33836	1.35948	1.34836					0.02112	0.01000	0.01002	225
26	SMSA51 B	1.32086	1.34142	1.33079					0.02056	0.00993	0.00995	219
27	SMRD181 A	1.30857	1.32313	1.31518					0.01456	0.00661	0.00663	72
28	SMRD181 B	1.32781	1.34188	1.33447					0.01407	0.00666	0.00668	73
29	SMRA91 A	1.31750	1.33231	1.32409	1.32439	1.32417	1.32411	1.32408	0.01481	0.00659	0.00661	72
30	SMRA91 B	1.33411	1.34866	1.34070					0.01455	0.00659	0.00661	72
31	SMRC141 A	1.32137	1.34143	1.33111					0.02006	0.00974	0.00976	206
32	SMRC141 B	1.33382	1.35452	1.34392					0.02070	0.01010	0.01012	232
33	SMSA41 A	1.32092	1.33880	1.32931					0.01788	0.00839	0.00841	131
34	SMSA41 B	1.32377	1.34139	1.33218					0.01762	0.00841	0.00843	132
35	SMRD221 A	1.32462	1.34071	1.33246					0.01609	0.00784	0.00786	109
36	SMRD221 B	1.33118	1.34807	1.33922	1.33955	1.33920	1.33917	1.33920	0.01689	0.00804	0.00806	117
37	SMSF31 A	1.32132	1.33993	1.33032					0.01861	0.00900	0.00902	161
38	SMSF31 B	1.32547	1.34412	1.33458					0.01865	0.00911	0.00913	167
39	SMRA361 A	1.33811	1.36038	1.34907					0.02227	0.01096	0.01098	310
40	SMRA361B	1.32589	1.34805	1.33663					0.02216	0.01074	0.01076	288
41	SMRA572 A	1.33542	1.36198	1.34874					0.02656	0.01332	0.01334	683
42	SMRA572 B	1.32128	1.34707	1.33402					0.02579	0.01274	0.01276	563
43	SMSD181 A	1.31227	1.32763	1.31902					0.01536	0.00675	0.00677	76
44	SMSD181 B	1.32396	1.33892	1.33072					0.01496	0.00676	0.00678	76
45	SMSB281 A	1.32735	1.34389	1.33497	1.33524	1.33495	1.33494	1.33496	0.01654	0.00762	0.00764	101
46	SMSB281 B	1.32240	1.33852	1.33000					0.01612	0.00760	0.00762	101
47	SMRA551 A	1.34495	1.36030	1.35181					0.01535	0.00686	0.00688	78
48	SMRA551 B	1.32096	1.33498	1.32726					0.01402	0.00630	0.00632	65
49	SMRA262 A	1.33008	1.34366	1.33615					0.01358	0.00607	0.00609	60
50	SMRA262 B	1.33438	1.34780	1.34036					0.01342	0.00598	0.00600	58
51	SMRA481 A	1.32335	1.34621	1.33474					0.02286	0.01139	0.01141	358

Appendix J3
Mouse Lens Weight Data with Age Calculations

Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Stabilized Dried Gross Weight (g)	Check Gross Weight (g) 24 Hours	Check Gross Weight (g) 48 Hours	Check Gross Weight (g) 72 Hours	Check Gross Weight (g) 96 Hours	Lens Wet Weight (g)	Lens Stabilized Dried Weight (g)	Adjusted Dried Lens Weight (g)	Age, Using Adjusted Dried Lens Weight (d)
52	SMRA481 B	1.33074	1.35312	1.34178					0.02238	0.01104	0.01106	318
53	SMRA181 A	1.31892	1.33225	1.32477					0.01333	0.00585	0.00587	56
54	SMRA181 B	1.32901	1.34187	1.33465	1.33480	1.33458	1.33461	1.33464	0.01286	0.00564	0.00566	52
55	SMRD291 A	1.31283	1.32997	1.32099					0.01714	0.00816	0.00818	121
56	SMRD291 B	1.30852	1.32607	1.31667					0.01755	0.00815	0.00817	121
57	SMRA251 A	1.32004	1.33356	1.32600					0.01352	0.00596	0.00598	58
58	SMRA251 B	1.31751	1.33096	1.32338					0.01345	0.00587	0.00589	56
59	SMRA261 A	1.32890	1.34215	1.33459	1.33477	1.33460	1.33465	1.33457	0.01325	0.00569	0.00571	53
60	SMRA261 B	1.33130	1.34424	1.33707					0.01294	0.00577	0.00579	54
61	SMRA263 A	1.33098	1.35572	1.34307					0.02474	0.01209	0.01211	452
62	SMRA263 B	1.33412	1.35894	1.34648					0.02482	0.01236	0.01238	495
63	SMRD31 A	1.32267	1.34309	1.33334					0.02042	0.01067	0.01069	281
64	SMRD31 B	1.33950	1.36106	1.35027	1.35057	1.35027	1.35024	1.35025	0.02156	0.01077	0.01079	291
65	SMRA291 A	1.32835	1.35001	1.33908					0.02166	0.01073	0.01075	287
66	SMRA291 B	1.33244	1.35463	1.34323					0.02219	0.01079	0.01081	293
67	SMRA31 A	1.31097	1.32577	1.31759					0.01480	0.00662	0.00664	72
68	SMRA31 B	1.32297	1.33749	1.32963					0.01452	0.00666	0.00668	73
69	SMRA51 A	1.33427	1.34846	1.34072	1.34083	1.34073	1.34069	1.34070	0.01419	0.00645	0.00647	68
70	SMRA51 B	1.32489	1.33881	1.33135					0.01392	0.00646	0.00648	69
71	SMRB151 A	1.32623	1.34483	1.33513					0.01860	0.00890	0.00892	155
72	SMRB151 B	1.32346	1.34194	1.33258					0.01848	0.00912	0.00914	167
73	SMRA491 A	1.32641	1.34952	1.33755					0.02311	0.01114	0.01116	329
74	SMRA491 B	1.34329	1.36641	1.35469	1.35510	1.35485	1.35480	1.35471	0.02312	0.01140	0.01142	359
75	SMSF21 A	1.32218	1.33855	1.32985					0.01637	0.00767	0.00769	103
76	SMSF21 B	1.32833	1.34491	1.33610					0.01658	0.00777	0.00779	106
77	SMSA111 A	1.32448	1.34372	1.33367					0.01924	0.00919	0.00921	171
78	SMSA111 B	1.32110	1.34041	1.33036					0.01931	0.00926	0.00928	175
79	SMSB61 A	1.32441	1.34163	1.33218	1.33244	1.33229	1.33219	1.33224	0.01722	0.00777	0.00779	106
80	SMSB61 B	1.32349	1.33960	1.33119					0.01611	0.00770	0.00772	104
81	SMSD41 A	1.32380	1.34080	1.33129					0.01700	0.00749	0.00751	97
82	SMSD41 B	1.31424	1.33148	1.32168					0.01724	0.00744	0.00746	95
83	SMSD101 A	1.32239	1.33837	1.32991					0.01598	0.00752	0.00754	98
84	SMSD101 B	1.32731	1.34372	1.33495					0.01641	0.00764	0.00766	102
85	SMRA271 A	1.31867	1.33461	1.32601					0.01594	0.00734	0.00736	92
86	SMRA271 B	1.33028	1.34658	1.33771					0.01630	0.00743	0.00745	95
87	SMSA52 A	1.31857	1.33859	1.32796	1.32837	1.32816	1.32806	1.32797	0.02002	0.00939	0.00941	183
88	SMSA52 B	1.33812	1.35811	1.34779					0.01999	0.00967	0.00969	201
89	SMSD111 A	1.33380	1.35298	1.34311					0.01918	0.00931	0.00933	178
90	SMSD111 B	1.33112	1.35026	1.34049					0.01914	0.00937	0.00939	182
91	SMSA291 A	1.32050	1.33972	1.32893					0.01922	0.00843	0.00845	133
92	SMSA291 B	1.32406	1.34255	1.33262					0.01849	0.00856	0.00858	139
93	SMRA401 A	1.33137	1.34810	1.33900	1.33921	1.33913	1.33908	1.33897	0.01673	0.00763	0.00765	102
94	SMRA401 B	1.31374	1.33034	1.32139					0.01660	0.00765	0.00767	102
95	SMSA31 A	1.33054	1.34648	1.33768					0.01594	0.00714	0.00716	86
96	SMSA31 B	1.31123	1.32733	1.31828					0.01610	0.00705	0.00707	84
97	SMRA621 A	1.31020	1.33103	1.32046	1.32076	1.32065	1.32060	1.32049	0.02083	0.01026	0.01028	245
98	SMRA621 B	1.31791	1.34044	1.32873					0.02253	0.01082	0.01084	296
99	SMSA121 A	1.32446	1.34193	1.33231					0.01747	0.00785	0.00787	109
100	SMSA121 B	1.31754	1.33549	1.32538					0.01795	0.00784	0.00786	109
101	SMSA171 A	1.31919	1.33828	1.32813	1.32827	1.32818	1.32820	1.32819	0.01909	0.00894	0.00896	158
102	SMSA171 B	1.35087	1.37021	1.35986					0.01934	0.00899	0.00901	160

Appendix J3
Mouse Lens Weight Data with Age Calculations

Boat No.	Sample #	Tare Weight (g)	Wet Weight (g)	Stabilized Dried Gross Weight (g)	Check Gross Weight (g) 24 Hours	Check Gross Weight (g) 48 Hours	Check Gross Weight (g) 72 Hours	Check Gross Weight (g) 96 Hours	Lens Wet Weight (g)	Lens Stabilized Dried Weight (g)	Adjusted Dried Lens Weight (g)	Age, Using Adjusted Dried Lens Weight (d)
103	SMSA61 A	1.32824	1.34382	1.33524					0.01558	0.00700	0.00702	82
104	SMSA61 B	1.33266	1.34728	1.33942					0.01462	0.00676	0.00678	76
105	SMSA311 A	1.33082	1.34581	1.33771					0.01499	0.00689	0.00691	79
106	SMSA311 B	1.32879	1.34385	1.33565					0.01506	0.00686	0.00688	78
107	SMRA191 A	1.31332	1.32580	1.31855					0.01248	0.00523	0.00525	45
108	SMRA191B	1.31071	1.32319	1.31607					0.01248	0.00536	0.00538	47
109	SMSB11 A	1.32621	1.34299	1.33389					0.01678	0.00768	0.00770	103
110	SMSB11 B	1.31920	1.33575	1.32669	1.32680	1.32669	1.32668	1.32672	0.01655	0.00749	0.00751	97
111	SMSB331 A	1.32257	1.34542	1.33373					0.02285	0.01116	0.01118	331
112	SMSB331 B	1.32957	1.35278	1.34068					0.02321	0.01111	0.01113	326
113	SMSB351 A	1.32520	1.34209	1.33313					0.01689	0.00793	0.00795	112
114	SMSB351 B	1.32887	1.34647	1.33666	1.33685	1.33668	1.33665	1.33673	0.01760	0.00779	0.00781	107
115	SMSF161 A	1.33212	1.34978	1.34030					0.01766	0.00818	0.00820	122
116	SMSF161 B	1.32453	1.34049	1.33234					0.01596	0.00781	0.00783	108
117	SMRA321 A	1.33214	1.35362	1.34256					0.02148	0.01042	0.01044	259
118	SMRA321 B	1.32688	1.34807	1.33719	1.33740	1.33728	1.33719	1.33720	0.02119	0.01031	0.01033	249
119	SMSD71 A	1.33483	1.35806	1.34617					0.02323	0.01134	0.01136	352
120	SMSD71 B	1.33601	1.35959	1.34727					0.02358	0.01126	0.01128	343
121	SMSC71 A	1.32761	1.34069	1.33340					0.01308	0.00579	0.00581	55
122	SMSC71 B	1.33103	1.34312	1.33657					0.01209	0.00554	0.00556	50
123	SMSA21 A	1.32972	1.34545	1.33675					0.01573	0.00703	0.00705	83
124	SMSA21 B	1.33321	1.34898	1.34025					0.01577	0.00704	0.00706	83
125	SMRC31 A	1.31928	1.33445	1.32639					0.01517	0.00711	0.00713	85
126	SMRC31 B	1.34610	1.36079	1.35301					0.01469	0.00691	0.00693	80
127	SMSA42 A	1.32132	1.34032	1.33026	1.33058	1.33032	1.33032	1.33026	0.01900	0.00894	0.00896	158
128	SMSA42 B	1.32198	1.34107	1.33096					0.01909	0.00898	0.00900	160
129	SMSC111 A	1.31656	1.33465	1.32494					0.01809	0.00838	0.00840	131
130	SMSC111 B	1.32367	1.34191	1.33196					0.01824	0.00829	0.00831	127
131	SMSC161 A	1.32664	1.34326	1.33447	1.33460	1.33436	1.33440	1.33443	0.01662	0.00783	0.00785	109
132	SMSC161 B	1.32129	1.33809	1.32906					0.01680	0.00777	0.00779	106
133	SMSF11 A	1.31281	1.33574	1.32411					0.02293	0.01130	0.01132	347
134	SMSF11 B	1.32279	1.34629	1.33432					0.02350	0.01153	0.01155	375
135	SMSA191 A	1.31248	1.33634	1.32397					0.02386	0.01149	0.01151	370
136	SMSA191 B	1.31506	1.33830	1.32661					0.02324	0.01155	0.01157	378
137	SMRA111 A	1.31408	1.33668	1.32481					0.02260	0.01073	0.01075	287
138	SMRA111 B	1.31842	1.34064	1.32935					0.02222	0.01093	0.01095	307
139	SMSA91 A	1.31516	1.33236	1.32308					0.01720	0.00792	0.00794	112
140	SMSA91 B	1.31593	1.33273	1.32367					0.01680	0.00774	0.00776	105
141	SMSA211 A	1.30847	1.32667	1.31680					0.01820	0.00833	0.00835	128
142	SMSA211 B	1.30696	1.32594	1.31528	1.31546	1.31526	1.31528	1.31526	0.01898	0.00832	0.00834	128
143	SMSD191 A	1.33405	1.35024	1.34137					0.01619	0.00732	0.00734	92
144	SMSD191 B	1.34047	1.35791	1.34790					0.01744	0.00743	0.00745	95

APPENDIX J4
MAMMAL AGE

Appendix J4
Mammal Age

Date	Transect ID	Transect	Trap#	Animal#	Species Collected (Common Name)	Weight (g)	Length (cm)	Sex	Alive	UTM W Long	UTM N	Lat	Eye Weight Sample#	Calculated Age (d), Using Average Lens Weight
8/27/2009	SM-R-A	Transect A	5	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.4	15.2	M	Yes	609211	5369865		SMRA51	6
8/27/2009	SM-R-A	Transect A	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	17.1	16.5	F	Yes	609197	5369853		SMRA111	11
8/27/2009	SM-R-A	Transect A	26	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.5	14.6	F	Yes	609168	5369794		SMRA261	6
8/27/2009	SM-R-A	Transect A	27	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.1	15.9	F	Yes	609165	5369782		SMRA271	7
8/27/2009	SM-R-A	Transect A	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	20.1	17.1	M	Yes	609159	5369773		SMRA291	11
8/27/2009	SM-R-A	Transect A	32	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.4	15.2	F	Yes	609157	5369760		SMRA321	10
8/27/2009	SM-R-A	Transect A	40	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.1	15.9	F	Yes	609141	5369726		SMRA401	8
8/27/2009	SM-R-B	Transect B	1	1	<i>Neotoma cinerea</i> (Bushy- tailed woodrat)	Unk	Unk	Unk	Yes	607891	5368638		Eyes not weighed	NA
8/27/2009	SM-R-B	Transect B	15	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.5	16.5	F	Yes	607888	5368601		SMRB151	9
8/27/2009	SM-R-B	Transect B	17	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	607882	5368566		Eyes not weighed	NA
8/27/2009	SM-R-B	Transect B	29	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	607868	5368511		Eyes not weighed	NA
8/28/2009	SM-R-A	Transect A	26	2	<i>Peromyscus maniculatus</i> (Deer mouse)	11.8	14.6	M	Yes	609165	5369792		SMRA262	6
8/28/2009	SM-R-A	Transect A	31	1	<i>Peromyscus maniculatus</i> (Deer mouse)	20.6	17.8	M	Yes	609156	5369770		SMRA311	11
8/28/2009	SM-R-A	Transect A	36	1	<i>Peromyscus maniculatus</i> (Deer mouse)	20.8	17.8	F	Yes	609127	5369752		SMRA361	11
8/28/2009	SM-R-A	Transect A	56	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.8	17.8	F	Yes	609107	5369669		SMRA561	7
8/28/2009	SM-R-A	Transect A	57	1	<i>Peromyscus maniculatus</i> (Deer mouse)	20	17.8	F	Yes	609109	5369664		SMRA571	9
8/28/2009	SM-R-C	Transect C	14	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.2	17.1	F	Yes	608684	5368050		SMRC141	10
8/28/2009	SM-R-C	Transect C	20	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.4	16.5	M	Yes	608679	5368032		SMRC201	11
8/28/2009	SM-R-C	Transect C	21	1	<i>Neotoma cinerea</i> (Bushy- tailed woodrat)	Unk	Unk	Unk	Yes	608680	5368051		Eyes not weighed	NA
8/28/2009	SM-R-D	Transect D	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	10.7	14.6	F	Yes	609134	5369943		SMRD41	7
8/28/2009	SM-R-D	Transect D	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.2	15.6	F	Yes	609103	5369881		SMRD181	7
8/28/2009	SM-R-D	Transect D	22	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.3	16.5	M	Yes	609108	5369892		SMRD221	8
8/28/2009	SM-R-D	Transect D	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.3	17.1	F	Yes	609120	5369920		SMRD291	8
8/29/2009	SM-R-A	Transect A	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	10.4	14.9	M	Yes	609209	5369885		SMRA31	7
8/29/2009	SM-R-A	Transect A	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.6	14.9	F	Yes	609179	5369823		SMRA191	5
8/29/2009	SM-R-A	Transect A	25	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609166	5369791		Eyes not weighed	NA

Appendix J4
Mammal Age

Date	Transect ID	Transect	Trap#	Animal#	Species Collected (Common Name)	Weight (g)	Length (cm)	Sex	Alive	UTM W Long	UTM N Lat	Eye Weight Sample#	Calculated Age (d), Using Average Lens Weight
8/29/2009	SM-R-A	Transect A	48	1	<i>Peromyscus maniculatus</i> (Deer mouse)	18	17.8	F	Yes	609121	5369697	SMRA481	11
8/29/2009	SM-R-A	Transect A	49	1	<i>Peromyscus maniculatus</i> (Deer mouse)	19.4	17.1	M	Yes	609120	5369698	SMRA491	11
8/29/2009	SM-R-A	Transect A	57	2	<i>Peromyscus maniculatus</i> (Deer mouse)	17	17.1	M	Yes	609108	5369662	SMRA572	13
8/29/2009	SM-R-A	Transect A	62	1	<i>Peromyscus maniculatus</i> (Deer mouse)	19.6 (a)	17.1	M	Yes	609097	5369636	SMRA621	11
8/29/2009	SM-R-C	Transect C	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.4	16.5	F	Yes	608707	5368063	SMRC31	7
8/29/2009	SM-R-C	Transect C	10	1	<i>Peromyscus maniculatus</i> (Deer mouse)	17.4	17.5	F	Yes	608673	5368039	SMRC101	10
8/29/2009	SM-R-C	Transect C	20	2	<i>Peromyscus maniculatus</i> (Deer mouse)	13.7	15.2	F	Yes	608677	5368035	SMRC202	8
8/29/2009	SM-R-C	Transect C	21	2	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	608683	5368044	Eyes not weighed	NA
8/29/2009	SM-R-D	Transect D	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.8	17.1	F	Yes	609129	5369938	SMRD31	11
8/29/2009	SM-R-D	Transect D	23	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609108	5369893	Eyes not weighed	NA
8/29/2009	SM-R-D	Transect D	36	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609138	5369954	Eyes not weighed	NA
8/30/2009	SM-R-A	Transect A	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.2	14.6	F	Yes	609197	5369858	SMRA91	7
8/30/2009	SM-R-A	Transect A	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13	17.1	M	Yes	609178	5369817	SMRA181	6
8/30/2009	SM-R-A	Transect A	25	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.5	14.6	F	Yes	609168	5369790	SMRA251	6
8/30/2009	SM-R-A	Transect A	26	3	<i>Peromyscus maniculatus</i> (Deer mouse)	18.1	17.8	F	Yes	609168	5369789	SMRA263	12
8/30/2009	SM-R-A	Transect A	29	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609159	5369774	Eyes not weighed	NA
8/30/2009	SM-R-A	Transect A	30	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609161	5369767	Eyes not weighed	NA
8/30/2009	SM-R-A	Transect A	50	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609118	5369689	Eyes not weighed	NA
8/30/2009	SM-R-A	Transect A	53	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	609112	5369679	Eyes not weighed	NA
8/30/2009	SM-R-A	Transect A	55	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.6	15.2	M	Yes	609111	5369671	SMRA551	7
8/30/2009	SM-S-A	Transect A	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14	16.2	M	Yes	619001	5367296	SMSA41	8
8/30/2009	SM-S-A	Transect A	5	1	<i>Peromyscus maniculatus</i> (Deer mouse)	19.8	17.1	M	Yes	619001	5367294	SMSA51	10
8/30/2009	SM-S-A	Transect A	6	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.8	16.5	F	Yes	619006	5367288	SMSA61	7
8/30/2009	SM-S-A	Transect A	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	17.4 (a)	16.5	M	Yes	619027	5367279	SMSA111	9
8/30/2009	SM-S-A	Transect A	12	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.9	15.9	M	Yes	619032	5367276	SMSA121	8
8/30/2009	SM-S-A	Transect A	21	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.2	15.9	M	Yes	619065	5367254	SMSA211	8

Appendix J4
Mammal Age

Date	Transect ID	Transect	Trap#	Animal#	Species Collected (Common Name)	Weight (g)	Length (cm)	Sex	Alive	UTM W Long	UTM N Lat	Eye Weight Sample#	Calculated Age (d), Using Average Lens Weight
8/30/2009	SM-S-A	Transect A	29	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.8	15.2	F	Yes	619094	5367230	SMSA291	9
8/30/2009	SM-S-B	Transect B	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13	15.2	F	Yes	618592	5367601	SMSB11	8
8/30/2009	SM-S-B	Transect B	6	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.9	14.9	M	Yes	618590	5367579	SMSB61	8
8/30/2009	SM-S-B	Transect B	28	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.3	14.6	M	Yes	618575	5367564	SMSB281	8
8/30/2009	SM-S-B	Transect B	33	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.9	15.9	F	Yes	618581	5367581	SMSB331	11
8/30/2009	SM-S-B	Transect B	35	1	<i>Peromyscus maniculatus</i> (Deer mouse)	10.5	14.6	M	Yes	618582	5367589	SMSB351	8
8/31/2009	SM-S-A	Transect A	2	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.1	15.9	F	Yes	618990	5367288	SMSA21	7
8/31/2009	SM-S-A	Transect A	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.7	15.6	M	Yes	618993	5367288	SMSA31	7
8/31/2009	SM-S-A	Transect A	4	1	<i>Zapus princeps</i> (Western jumping mouse)	Unk	Unk	Unk	Yes	619003	5367287	Eyes not weighed	NA
8/31/2009	SM-S-A	Transect A	5	2	<i>Peromyscus maniculatus</i> (Deer mouse)	16.6	17.1	M	Yes	619005	5367288	SMSA52	10
8/31/2009	SM-S-A	Transect A	17	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619055	5367263	Eyes not weighed	NA
8/31/2009	SM-S-C	Transect C	7	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.1	14.6	F	Yes	618586	5367873	SMSC71	6
8/31/2009	SM-S-C	Transect C	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	17.6	15.9	M	Yes	618581	5367880	SMSC91	9
8/31/2009	SM-S-C	Transect C	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.2	14.6	F	Yes	618575	5367881	SMSC111	8
8/31/2009	SM-S-C	Transect C	13	1	<i>Neotoma cinerea</i> (Bushy- tailed woodrat)	Unk	Unk	Unk	Yes	618568	5367886	Eyes not weighed	NA
8/31/2009	SM-S-C	Transect C	16	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.1 (a)	15.2	F	Yes	618557	5367899	SMSC161	8
8/31/2009	SM-S-C	Transect C	17	1	<i>Peromyscus maniculatus</i> (Deer mouse)	Unk	Unk	Unk	Yes	618550	5367891	Eyes not weighed	NA
8/31/2009	SM-S-D	Transect D	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.5	16.5	M	Yes	617633	5367615	SMSD11	9
8/31/2009	SM-S-D	Transect D	4	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.5	13.3	F	Yes	617640	5367624	SMSD41	7
8/31/2009	SM-S-D	Transect D	7	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.5	15.2	F	Yes	617653	5367630	SMSD71	11
8/31/2009	SM-S-D	Transect D	10	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.1	14.6	F	Yes	617659	5367624	SMSD101	8
8/31/2009	SM-S-D	Transect D	11	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.7	15.9	M	Yes	617670	5367627	SMSD111	9
8/31/2009	SM-S-D	Transect D	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	13.2	15.9	F	Yes	617663	5367588	SMSD181	7
8/31/2009	SM-S-D	Transect D	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	11.7	13.3	F	Yes	617664	5367589	SMSD191	7
9/1/2009	SM-S-A	Transect A	4	2	<i>Peromyscus maniculatus</i> (Deer mouse)	14.7	15.6	F	Yes	619000	5367288	SMSA42	9
9/1/2009	SM-S-A	Transect A	8	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619010	5367276	Eyes not weighed	NA

Appendix J4
Mammal Age

Date	Transect ID	Transect	Trap#	Animal#	Species Collected (Common Name)	Weight (g)	Length (cm)	Sex	Alive	UTM W Long	UTM N Lat	Eye Weight Sample#	Calculated Age (d), Using Average Lens Weight
9/1/2009	SM-S-A	Transect A	9	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.2 (a)	16.2	M	Yes	619016	5367286	SMSA91	8
9/1/2009	SM-S-A	Transect A	14	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619039	5367271	Eyes not weighed	NA
9/1/2009	SM-S-A	Transect A	17	2	<i>Peromyscus maniculatus</i> (Deer mouse)	16.1 (a)	16.2	F	Yes	619054	5367266	SMSA171	9
9/1/2009	SM-S-A	Transect A	19	1	<i>Peromyscus maniculatus</i> (Deer mouse)	23.7	18.7	F	Yes	619060	5367257	SMSA191	12
9/1/2009	SM-S-A	Transect A	25	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619086	5367239	Eyes not weighed	NA
9/1/2009	SM-S-A	Transect A	31	1	<i>Peromyscus maniculatus</i> (Deer mouse)	16.0 (a)	15.6	M	Yes	619107	5367230	SMSA311	7
9/1/2009	SM-S-A	Transect A	32	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619112	5367226	Eyes not weighed	NA
9/1/2009	SM-S-A	Transect A	33	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619111	5367228	Eyes not weighed	NA
9/1/2009	SM-S-A	Transect A	34	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619117	5367224	Eyes not weighed	NA
9/1/2009	SM-S-E	Transect E	7	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619514	5366725	Eyes not weighed	NA
9/1/2009	SM-S-F	Transect F	1	1	<i>Peromyscus maniculatus</i> (Deer mouse)	20.7	18.4	M	Yes	618391	5367198	SMSF11	11
9/1/2009	SM-S-F	Transect F	2	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.8	16.5	M	Yes	618395	5367200	SMSF21	8
9/2/2009	SM-S-E	Transect E	12	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.6		M	Yes	619520	5366734	SMSE121	8
9/2/2009	SM-S-E	Transect E	13	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	619516	5366738	Eyes not weighed	NA
9/2/2009	SM-S-E	Transect E	18	1	<i>Peromyscus maniculatus</i> (Deer mouse)	19.3	17.5	M	Yes	619504	5366761	SMSE181	11
9/2/2009	SM-S-F	Transect F	3	1	<i>Peromyscus maniculatus</i> (Deer mouse)	14.6	15.6	M	Yes	618379	5367212	SMSF31	9
9/2/2009	SM-S-F	Transect F	7	1	<i>Tamias amoenus</i> (Yellow- pine Chipmunk)	Unk	Unk	Unk	Yes	618363	5367214	Eyes not weighed	NA
9/2/2009	SM-S-F	Transect F	15	1	<i>Peromyscus maniculatus</i> (Deer mouse)	12.6	15.6	F	Yes	618355	5367226	SMSF151	8
9/2/2009	SM-S-F	Transect F	16	1	<i>Peromyscus maniculatus</i> (Deer mouse)	15.1	14.9	M	Yes	618354	5367227	SMSF161	8

NA = Not Applicable
(a) = Weight corrected for bot fly larvae.

APPENDIX K
STATISTICS RESULTS

Following are the SPSS results for the Mann-Whitney Tests

Notes		
Output Created		01-Sep-2010 09:43:55
Comments		
Input	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	773
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /M-W= Larynx Trachea LeftMainstemBronchus LeftCranialLung LeftMiddleLung LeftCaudalLung RightMainstemBronchus RightCranialLung RightMiddleLung RightCaudalLung PostCavallLung Esophagus CardiacStomach Fundus Pylorus Duodenum Jejunum Ileum Cecum Colon Rectum Anus Adrenal Thyroid Score_wo_bot_liv Score_all BY Area(1 2) /MISSING ANALYSIS.
Resources	Processor Time	00 00:00:00.015
	Elapsed Time	00 00:00:00.016
	Number of Cases Allowed ^a	24576
a. Based on availability of workspace memory.		

Mann-Whitney Test for Individual Tissues

Ranks				
	Area	N	Mean Rank	Sum of Ranks
Larynx	1	33	30.67	1012.00
	2	38	40.63	1544.00
	Total	71		
Trachea	1	34	37.26	1267.00
	2	38	35.82	1361.00
	Total	72		
Left Mainstem Bronchus	1	32	29.91	957.00
	2	34	36.88	1254.00
	Total	66		
Left Cranial Lung	1	33	35.65	1176.50
	2	37	35.36	1308.50
	Total	70		
Left Middle Lung	1	33	35.88	1184.00
	2	37	35.16	1301.00
	Total	70		
Left Caudal Lung	1	33	36.88	1217.00
	2	37	34.27	1268.00
	Total	70		
Right Mainstem Bronchus	1	29	30.64	888.50
	2	33	32.26	1064.50
	Total	62		
Right Cranial Lung	1	34	35.29	1200.00
	2	38	37.58	1428.00
	Total	72		
Right Middle Lung	1	34	34.24	1164.00
	2	38	38.53	1464.00
	Total	72		
Right Caudal Lung	1	34	35.75	1215.50
	2	38	37.17	1412.50
	Total	72		
Post Caval Lung	1	33	35.20	1161.50
	2	37	35.77	1323.50
	Total	70		

Ranks

	Area	N	Mean Rank	Sum of Ranks
Esophagus	1	34	36.13	1228.50
	2	38	36.83	1399.50
	Total	72		
Cardiac Stomach	1	34	39.26	1335.00
	2	38	34.03	1293.00
	Total	72		
Fundus	1	34	36.04	1225.50
	2	38	36.91	1402.50
	Total	72		
Pylorus	1	34	36.72	1248.50
	2	37	35.34	1307.50
	Total	71		
Duodenum	1	34	35.59	1210.00
	2	38	37.32	1418.00
	Total	72		
Jejunum	1	34	34.96	1188.50
	2	38	37.88	1439.50
	Total	72		
Ileum	1	34	37.60	1278.50
	2	38	35.51	1349.50
	Total	72		
Cecum	1	34	37.01	1258.50
	2	38	36.04	1369.50
	Total	72		
Colon	1	34	38.74	1317.00
	2	38	34.50	1311.00
	Total	72		
Rectum	1	34	36.66	1246.50
	2	38	36.36	1381.50
	Total	72		
Anus	1	26	28.08	730.00
	2	28	26.96	755.00
	Total	54		
Adrenal	1	34	37.35	1270.00
	2	38	35.74	1358.00
	Total	72		

Ranks

	Area	N	Mean Rank	Sum of Ranks
Thyroid	1	32	34.06	1090.00
	2	36	34.89	1256.00
	Total	68		
Score_wo_bot_liver	1	34	36.06	1226.00
	2	38	36.89	1402.00
	Total	72		
Score_all	1	34	34.76	1182.00
	2	38	38.05	1446.00
	Total	72		

Test Statistics^a

	Larynx	Trachea	Left Mainstem Bronchus	Left Cranial Lung	Left Middle Lung
Mann-Whitney U	451.000	620.000	429.000	605.500	598.000
Wilcoxon W	1012.000	1361.000	957.000	1308.500	1301.000
Z	-2.171	-.319	-1.548	-.060	-.150
Asymp. Sig. (2-tailed)	.030	.750	.122	.952	.881

Test Statistics^a

	Left Caudal Lung	Right Mainstem Bronchus	Right Cranial Lung	Right Middle Lung	Right Caudal Lung
Mann-Whitney U	565.000	453.500	605.000	569.000	620.500
Wilcoxon W	1268.000	888.500	1200.000	1164.000	1215.500
Z	-.546	-.369	-.472	-.891	-.292
Asymp. Sig. (2-tailed)	.585	.712	.637	.373	.771

Test Statistics^a

	Post Caval Lung	Esophagus	Cardiac Stomach	Fundus	Pylorus
Mann-Whitney U	600.500	633.500	552.000	630.500	604.500
Wilcoxon W	1161.500	1228.500	1293.000	1225.500	1307.500
Z	-.119	-.320	-1.696	-.505	-.489
Asymp. Sig. (2-tailed)	.905	.749	.090	.614	.625

Test Statistics^a

	Duodenum	Jejunum	Ileum	Cecum	Colon	Rectum
Mann-Whitney U	615.000	593.500	608.500	628.500	570.000	640.500
Wilcoxon W	1210.000	1188.500	1349.500	1369.500	1311.000	1381.500
Z	-.523	-.711	-.583	-.232	-.946	-.156
Asymp. Sig. (2-tailed)	.601	.477	.560	.817	.344	.876

Test Statistics^a

	Anus	Adrenal	Thyroid	Score_wo_bot_l iver	Score_all
Mann-Whitney U	349.000	617.000	562.000	631.000	587.000
Wilcoxon W	755.000	1358.000	1090.000	1226.000	1182.000
Z	-.654	-.523	-.483	-.169	-.666
Asymp. Sig. (2-tailed)	.513	.601	.629	.866	.506

a. Grouping Variable: Area

NPar Tests for Tissue Groups

Mann-Whitney Test – Upper Respiratory Tract

		Ranks		
	Area_UpResp	N	Mean Rank	Sum of Ranks
UpperResp	1	128	127.11	16269.50
	2	143	143.96	20586.50
	Total	271		

Test Statistics ^a	
	UpperResp
Mann-Whitney U	8013.500
Wilcoxon W	16269.500
Z	-1.855
Asymp. Sig. (2-tailed)	.064

a. Grouping Variable: Area_UpResp

Mann-Whitney Test – Lower Respiratory Tract

		Ranks		
	Area_LwrResp	N	Mean Rank	Sum of Ranks
LowerResp	1	234	246.66	57719.50
	2	262	250.14	65536.50
	Total	496		

Test Statistics ^a	
	LowerResp
Mann-Whitney U	30224.500
Wilcoxon W	57719.500
Z	-.274
Asymp. Sig. (2-tailed)	.784

a. Grouping Variable: Area_LwrResp

Mann-Whitney Test – All Respiratory Organs

		Ranks		
	Area AllResp	N	Mean Rank	Sum of Ranks
AllResp	1	362	376.47	136282.50
	2	405	390.73	158245.50
	Total	767		

Test Statistics ^a	
	AllResp
Mann-Whitney U	70579.500
Wilcoxon W	136282.500
Z	-.904
Asymp. Sig. (2-tailed)	.366

a. Grouping Variable: Area_AllResp

Mann-Whitney Test – Upper Gastrointestinal Tract

		Ranks		
	Area_UpGI	N	Mean Rank	Sum of Ranks
UpperGI	1	136	146.83	19969.00
	2	151	141.45	21359.00
	Total	287		

Test Statistics ^a	
	UpperGI
Mann-Whitney U	9883.000
Wilcoxon W	21359.000
Z	-1.066
Asymp. Sig. (2-tailed)	.287

a. Grouping Variable: Area_UpGI

Mann-Whitney Test – Lower Gastrointestinal Tract

Ranks				
	Area_LwrGI	N	Mean Rank	Sum of Ranks
LowerGI	1	230	244.91	56329.00
	2	256	242.23	62012.00
	Total	486		

Test Statistics ^a	
	LowerGI
Mann-Whitney U	29116.000
Wilcoxon W	62012.000
Z	-.233
Asymp. Sig. (2-tailed)	.816

a. Grouping Variable: Area_LwrGI

Mann-Whitney Test – All Gastrointestinal Organs

Ranks				
	Area_AllGI	N	Mean Rank	Sum of Ranks
AllGi	1	366	390.01	142742.50
	2	407	384.30	156408.50
	Total	773		

Test Statistics ^a	
	AllGI
Mann-Whitney U	73380.500
Wilcoxon W	156408.500
Z	-.408
Asymp. Sig. (2-tailed)	.684

a. Grouping Variable: Area_AllGI

Following is the SPSS Output for Fisher's Exact test for individual tissues

Crosstabs

Notes		
Output Created		30-Aug-2010 15:38:38
Comments		
Input	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	773
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=Area BY Larynx Trachea LeftMainstemBronchus LeftCranialLung LeftMiddleLung LeftCaudalLung RightMainstemBronchus RightCranialLung RightMiddleLung RightCaudalLung PostCavalLung Esophagus CardiacStomach Fundus Pylorus Duodenum Jejunum Ileum Cecum Colon Rectum Anus Adrenal Thyroid /FORMAT=AVALUE TABLES /STATISTICS=CHISQ /CELLS=COUNT /COUNT ROUND CELL /METHOD=EXACT TIMER(5).
Resources	Processor Time	00 00:00:00.187
	Elapsed Time	00 00:00:00.235
	Dimensions Requested	2
	Cells Available	174762
	Time for Exact Statistics	00:00:00.120

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Area * Larynx	71	9.2%	702	90.8%	773	100.0%
Area * Trachea	72	9.3%	701	90.7%	773	100.0%
Area * Left Mainstem Bronchus	66	8.5%	707	91.5%	773	100.0%
Area * Left Cranial Lung	70	9.1%	703	90.9%	773	100.0%
Area * Left Middle Lung	70	9.1%	703	90.9%	773	100.0%
Area * Left Caudal Lung	70	9.1%	703	90.9%	773	100.0%
Area * Right Mainstem Bronchus	62	8.0%	711	92.0%	773	100.0%
Area * Right Cranial Lung	72	9.3%	701	90.7%	773	100.0%
Area * Right Middle Lung	72	9.3%	701	90.7%	773	100.0%
Area * Right Caudal Lung	72	9.3%	701	90.7%	773	100.0%
Area * Post Caval Lung	70	9.1%	703	90.9%	773	100.0%
Area * Esophagus	72	9.3%	701	90.7%	773	100.0%
Area * Cardiac Stomach	72	9.3%	701	90.7%	773	100.0%
Area * Fundus	72	9.3%	701	90.7%	773	100.0%
Area * Pylorus	71	9.2%	702	90.8%	773	100.0%
Area * Duodenum	72	9.3%	701	90.7%	773	100.0%
Area * Jejunum	72	9.3%	701	90.7%	773	100.0%
Area * Ileum	72	9.3%	701	90.7%	773	100.0%
Area * Cecum	72	9.3%	701	90.7%	773	100.0%
Area * Colon	72	9.3%	701	90.7%	773	100.0%
Area * Rectum	72	9.3%	701	90.7%	773	100.0%
Area * Anus	54	7.0%	719	93.0%	773	100.0%
Area * Adrenal	72	9.3%	701	90.7%	773	100.0%
Area * Thyroid	68	8.8%	705	91.2%	773	100.0%

Area * Larynx**Crosstab**

Count

		Larynx		Total
		0	1	
Area	1	18	15	33
	2	14	24	38
Total		32	39	71

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	2.236 ^a	1	.135	.157
Continuity Correction ^b	1.578	1	.209	
Likelihood Ratio	2.245	1	.134	.157
Fisher's Exact Test				.157
Linear-by-Linear Association	2.204 ^c	1	.138	.157
N of Valid Cases	71			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.104	
Continuity Correction ^b		
Likelihood Ratio	.104	
Fisher's Exact Test	.104	
Linear-by-Linear Association	.104	.063
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.87.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.485.

Area * Trachea**Crosstab**

Count

		Trachea		Total
		0	1	
Area	1	8	26	34
	2	10	28	38
Total		18	54	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.074 ^a	1	.785	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.074	1	.785	.794
Fisher's Exact Test				1.000
Linear-by-Linear Association	.073 ^c	1	.787	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.501	
Continuity Correction ^b		
Likelihood Ratio	.501	
Fisher's Exact Test	.501	
Linear-by-Linear Association	.501	.207
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.50.

b. Computed only for a 2x2 table

c. The standardized statistic is -.271.

Area * Left Mainstem Bronchus**Crosstab**

Count

		Left Mainstem Bronchus		Total
		0	1	
Area	1	11	21	32
	2	6	28	34
Total		17	49	66

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	2.412 ^a	1	.120	.162
Continuity Correction ^b	1.617	1	.204	
Likelihood Ratio	2.435	1	.119	.162
Fisher's Exact Test				.162
Linear-by-Linear Association	2.376 ^c	1	.123	.162
N of Valid Cases	66			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.102	
Continuity Correction ^b		
Likelihood Ratio	.102	
Fisher's Exact Test	.102	
Linear-by-Linear Association	.102	.069
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.24.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.541.

Area * Left Cranial Lung**Crosstab**

Count

		Left Cranial Lung		Total
		0	1	
Area	1	9	24	33
	2	7	30	37
Total		16	54	70

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.690 ^a	1	.406	.570
Continuity Correction ^b	.298	1	.585	
Likelihood Ratio	.690	1	.406	.570
Fisher's Exact Test				.570
Linear-by-Linear Association	.680 ^c	1	.409	.570
N of Valid Cases	70			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.292	
Continuity Correction ^b		
Likelihood Ratio	.292	
Fisher's Exact Test	.292	
Linear-by-Linear Association	.292	.160
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.54.

b. Computed only for a 2x2 table

c. The standardized statistic is .825.

Area * Left Middle Lung**Crosstab**

Count

		Left Middle Lung		Total
		0	1	
Area	1	10	23	33
	2	10	27	37
Total		20	50	70

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.092 ^a	1	.762	.796
Continuity Correction ^b	.001	1	.970	
Likelihood Ratio	.092	1	.762	.796
Fisher's Exact Test				.796
Linear-by-Linear Association	.090 ^c	1	.764	.796
N of Valid Cases	70			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.484	
Continuity Correction ^b		
Likelihood Ratio	.484	
Fisher's Exact Test	.484	
Linear-by-Linear Association	.484	.199
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.43.

b. Computed only for a 2x2 table

c. The standardized statistic is .301.

Area * Left Caudal Lung**Crosstab**

Count

		Left Caudal Lung		Total
		0	1	
Area	1	4	29	33
	2	5	32	37
Total		9	61	70

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.030 ^a	1	.862	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.030	1	.862	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.030 ^c	1	.863	1.000
N of Valid Cases	70			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.574	
Continuity Correction ^b		
Likelihood Ratio	.574	
Fisher's Exact Test	.574	
Linear-by-Linear Association	.574	.274
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 4.24.

b. Computed only for a 2x2 table

c. The standardized statistic is -.172.

Area * Right Mainstem Bronchus**Crosstab**

Count

		Right Mainstem Bronchus		Total
		0	1	
Area	1	9	20	29
	2	11	22	33
Total		20	42	62

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.037 ^a	1	.847	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.037	1	.847	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.037 ^c	1	.848	1.000
N of Valid Cases	62			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.532	
Continuity Correction ^b		
Likelihood Ratio	.532	
Fisher's Exact Test	.532	
Linear-by-Linear Association	.532	.211
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.35.

b. Computed only for a 2x2 table

c. The standardized statistic is -.192.

Area * Right Cranial Lung**Crosstab**

Count

		Right Cranial Lung		Total
		0	1	
Area	1	5	29	34
	2	5	33	38
Total		10	62	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.036 ^a	1	.850	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.036	1	.850	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.035 ^c	1	.851	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.558	
Continuity Correction ^b		
Likelihood Ratio	.558	
Fisher's Exact Test	.558	
Linear-by-Linear Association	.558	.260
N of Valid Cases		

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.72.

b. Computed only for a 2x2 table

c. The standardized statistic is .188.

Area * Right Middle Lung**Crosstab**

Count

		Right Middle Lung		Total
		0	1	
Area	1	8	26	34
	2	6	32	38
Total		14	58	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.686 ^a	1	.407	.553
Continuity Correction ^b	.281	1	.596	
Likelihood Ratio	.686	1	.407	.553
Fisher's Exact Test				.553
Linear-by-Linear Association	.677 ^c	1	.411	.553
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.298	
Continuity Correction ^b		
Likelihood Ratio	.298	
Fisher's Exact Test	.298	
Linear-by-Linear Association	.298	.168
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.61.

b. Computed only for a 2x2 table

c. The standardized statistic is .823.

Area * Right Caudal Lung**Crosstab**

Count

		Right Caudal Lung		Total
		0	1	
Area	1	1	33	34
	2	3	35	38
Total		4	68	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.839 ^a	1	.360	.617
Continuity Correction ^b	.161	1	.689	
Likelihood Ratio	.883	1	.347	.617
Fisher's Exact Test				.617
Linear-by-Linear Association	.828 ^c	1	.363	.617
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.351	
Continuity Correction ^b		
Likelihood Ratio	.351	
Fisher's Exact Test	.351	
Linear-by-Linear Association	.351	.279
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.89.

b. Computed only for a 2x2 table

c. The standardized statistic is -.910.

Area * Post Caval Lung**Crosstab**

Count

		Post Caval Lung		Total
		0	1	
Area	1	4	29	33
	2	6	31	37
Total		10	60	70

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.239 ^a	1	.625	.739
Continuity Correction ^b	.021	1	.883	
Likelihood Ratio	.241	1	.624	.739
Fisher's Exact Test				.739
Linear-by-Linear Association	.235 ^c	1	.628	.739
N of Valid Cases	70			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.444	
Continuity Correction ^b		
Likelihood Ratio	.444	
Fisher's Exact Test	.444	
Linear-by-Linear Association	.444	.240
N of Valid Cases		

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.71.

b. Computed only for a 2x2 table

c. The standardized statistic is -.485.

Area * Esophagus**Crosstab**

Count

		Esophagus		Total
		0	1	
Area	1	32	2	34
	2	35	3	38
Total		67	5	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.112 ^a	1	.737	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.113	1	.736	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.111 ^c	1	.739	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.553	
Continuity Correction ^b		
Likelihood Ratio	.553	
Fisher's Exact Test	.553	
Linear-by-Linear Association	.553	.338
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.36.

b. Computed only for a 2x2 table

c. The standardized statistic is .333.

Area * Cardiac Stomach**Crosstab**

Count

		Cardiac Stomach		Total
		0	1	
Area	1	26	8	34
	2	35	3	38
Total		61	11	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	3.389 ^a	1	.066	.101
Continuity Correction ^b	2.289	1	.130	
Likelihood Ratio	3.469	1	.063	.101
Fisher's Exact Test				.101
Linear-by-Linear Association	3.342 ^c	1	.068	.101
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.065	
Continuity Correction ^b		
Likelihood Ratio	.065	
Fisher's Exact Test	.065	
Linear-by-Linear Association	.065	.051
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.19.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.828.

Area * Fundus**Crosstab**

Count

		Fundus		Total
		0	1	
Area	1	33	1	34
	2	36	2	38
Total		69	3	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.242 ^a	1	.623	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.248	1	.619	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.239 ^c	1	.625	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.542	
Continuity Correction ^b		
Likelihood Ratio	.542	
Fisher's Exact Test	.542	
Linear-by-Linear Association	.542	.401
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.42.

b. Computed only for a 2x2 table

c. The standardized statistic is .489.

Area * Pylorus**Crosstab**

Count

	Pylorus		Total
	0	1	
Area 1	29	5	34
2	33	4	37
Total	62	9	71

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.243 ^a	1	.622	.729
Continuity Correction ^b	.018	1	.892	
Likelihood Ratio	.243	1	.622	.729
Fisher's Exact Test				.729
Linear-by-Linear Association	.239 ^c	1	.625	.729
N of Valid Cases	71			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.445	
Continuity Correction ^b		
Likelihood Ratio	.445	
Fisher's Exact Test	.445	
Linear-by-Linear Association	.445	.247
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 4.31.

b. Computed only for a 2x2 table

c. The standardized statistic is -.489.

Area * Duodenum**Crosstab**

Count

		Duodenum		Total
		0	1	
Area	1	7	27	34
	2	4	34	38
Total		11	61	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.404 ^a	1	.236	.329
Continuity Correction ^b	.734	1	.392	
Likelihood Ratio	1.411	1	.235	.329
Fisher's Exact Test				.329
Linear-by-Linear Association	1.384 ^c	1	.239	.329
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.196	
Continuity Correction ^b		
Likelihood Ratio	.196	
Fisher's Exact Test	.196	
Linear-by-Linear Association	.196	.131
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.19.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.176.

Area * Jejunum**Crosstab**

Count

		Jejunum		Total
		0	1	
Area	1	6	28	34
	2	3	35	38
Total		9	63	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.560 ^a	1	.212	.291
Continuity Correction ^b	.796	1	.372	
Likelihood Ratio	1.576	1	.209	.291
Fisher's Exact Test				.291
Linear-by-Linear Association	1.539 ^c	1	.215	.291
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.186	
Continuity Correction ^b		
Likelihood Ratio	.186	
Fisher's Exact Test	.186	
Linear-by-Linear Association	.186	.133
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 4.25.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.240.

Area * Ileum**Crosstab**

Count

		Ileum		Total
		0	1	
Area	1	2	32	34
	2	3	35	38
Total		5	67	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.112 ^a	1	.737	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.113	1	.736	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.111 ^c	1	.739	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.553	
Continuity Correction ^b		
Likelihood Ratio	.553	
Fisher's Exact Test	.553	
Linear-by-Linear Association	.553	.338
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.36.

b. Computed only for a 2x2 table

c. The standardized statistic is -.333.

Area * Cecum**Crosstab**

Count

		Cecum		Total
		0	1	
Area	1	9	25	34
	2	8	30	38
Total		17	55	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.292 ^a	1	.589	.782
Continuity Correction ^b	.069	1	.793	
Likelihood Ratio	.292	1	.589	.782
Fisher's Exact Test				.782
Linear-by-Linear Association	.288 ^c	1	.592	.782
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.396	
Continuity Correction ^b		
Likelihood Ratio	.396	
Fisher's Exact Test	.396	
Linear-by-Linear Association	.396	.189
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.03.

b. Computed only for a 2x2 table

c. The standardized statistic is .537.

Area * Colon**Crosstab**

Count

		Colon		Total
		0	1	
Area	1	15	19	34
	2	19	19	38
Total		34	38	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.249 ^a	1	.618	.644
Continuity Correction ^b	.069	1	.793	
Likelihood Ratio	.249	1	.618	.644
Fisher's Exact Test				.644
Linear-by-Linear Association	.246 ^c	1	.620	.644
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.397	
Continuity Correction ^b		
Likelihood Ratio	.397	
Fisher's Exact Test	.397	
Linear-by-Linear Association	.397	.165
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.06.

b. Computed only for a 2x2 table

c. The standardized statistic is -.496.

Area * Rectum**Crosstab**

Count

		Rectum		Total
		0	1	
Area	1	32	2	34
	2	36	2	38
Total		68	4	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.013 ^a	1	.909	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.013	1	.909	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.013 ^c	1	.909	1.000
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.649	
Continuity Correction ^b		
Likelihood Ratio	.649	
Fisher's Exact Test	.649	
Linear-by-Linear Association	.649	.383
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.89.

b. Computed only for a 2x2 table

c. The standardized statistic is -.114.

Area * Anus**Crosstab**

Count

		Anus		Total
		0	1	
Area	1	24	2	26
	2	27	1	28
Total		51	3	54

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.436 ^a	1	.509	.604
Continuity Correction ^b	.004	1	.947	
Likelihood Ratio	.442	1	.506	.604
Fisher's Exact Test				.604
Linear-by-Linear Association	.428 ^c	1	.513	.604
N of Valid Cases	54			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.472	
Continuity Correction ^b		
Likelihood Ratio	.472	
Fisher's Exact Test	.472	
Linear-by-Linear Association	.472	.367
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.44.

b. Computed only for a 2x2 table

c. The standardized statistic is -.654.

Area * Adrenal**Crosstab**

Count

		Adrenal		Total
		0	1	
Area	1	28	6	34
	2	33	5	38
Total		61	11	72

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.279 ^a	1	.597	.746
Continuity Correction ^b	.040	1	.841	
Likelihood Ratio	.279	1	.597	.746
Fisher's Exact Test				.746
Linear-by-Linear Association	.276 ^c	1	.600	.746
N of Valid Cases	72			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.419	
Continuity Correction ^b		
Likelihood Ratio	.419	
Fisher's Exact Test	.419	
Linear-by-Linear Association	.419	.223
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.19.

b. Computed only for a 2x2 table

c. The standardized statistic is -.525.

Area * Thyroid**Crosstab**

Count		Thyroid		Total
		0	1	
Area	1	31	1	32
	2	34	2	36
Total		65	3	68

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.237 ^a	1	.626	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.243	1	.622	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.234 ^c	1	.629	1.000
N of Valid Cases	68			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.545	
Continuity Correction ^b		
Likelihood Ratio	.545	
Fisher's Exact Test	.545	
Linear-by-Linear Association	.545	.402
N of Valid Cases		

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.41.

b. Computed only for a 2x2 table

c. The standardized statistic is .484.

Following is the SPSS Output for Fisher's Exact test for groups of tissues **Crosstabs- Upper Respiratory Tract**

Area_UR * Upp_Resp Crosstabulation

Count

		Upp_Resp		Total
		0	1	
Area_UR	1	46	82	128
	2	41	102	143
Total		87	184	271

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.636 ^a	1	.201	.241
Continuity Correction ^b	1.320	1	.251	
Likelihood Ratio	1.635	1	.201	.241
Fisher's Exact Test				.241
Linear-by-Linear Association	1.630 ^c	1	.202	.241
N of Valid Cases	271			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.125	
Continuity Correction ^b		
Likelihood Ratio	.125	
Fisher's Exact Test	.125	
Linear-by-Linear Association	.125	.046
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 41.09.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.277.

Crosstabs- Lower Respiratory Tract

Area_LR * Lwr_Resp Crosstabulation

Count

		Lwr Resp		Total
		0	1	
Area_LR	1	41	193	234
	2	42	220	262
Total		83	413	496

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.197 ^a	1	.657	.718
Continuity Correction ^b	.105	1	.746	
Likelihood Ratio	.197	1	.657	.718
Fisher's Exact Test				.718
Linear-by-Linear Association	.197 ^c	1	.657	.718
N of Valid Cases	496			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.373	
Continuity Correction ^b		
Likelihood Ratio	.373	
Fisher's Exact Test	.373	
Linear-by-Linear Association	.373	.087
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 39.16.

b. Computed only for a 2x2 table

c. The standardized statistic is .444.

Crosstabs – All Respiratory Organs

Area_AIRR * All_Resp Crosstabulation

Count

		All Resp		Total
		0	1	
Area_AIRR	1	87	275	362
	2	83	322	405
Total		170	597	767

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.388 ^a	1	.239	.258
Continuity Correction ^b	1.190	1	.275	
Likelihood Ratio	1.386	1	.239	.258
Fisher's Exact Test				.258
Linear-by-Linear Association	1.386 ^c	1	.239	.258
N of Valid Cases	767			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.138	
Continuity Correction ^b		
Likelihood Ratio	.138	
Fisher's Exact Test	.138	
Linear-by-Linear Association	.138	.035
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 80.23.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.177.

Crosstabs – Upper Gastrointestinal Tract

Area_UG * Uppr_GI Crosstabulation

Count

		Uppr_GI		Total
		0	1	
Area_UG	1	120	16	136
	2	139	12	151
Total		259	28	287

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.185 ^a	1	.276	.322
Continuity Correction ^b	.791	1	.374	
Likelihood Ratio	1.184	1	.277	.322
Fisher's Exact Test				.322
Linear-by-Linear Association	1.180 ^c	1	.277	.322
N of Valid Cases	287			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.187	
Continuity Correction ^b		
Likelihood Ratio	.187	
Fisher's Exact Test	.187	
Linear-by-Linear Association	.187	.088
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.27.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.086.

Crosstabs – Lower Gastrointestinal Tract

Area_LG * Lwr_GI Crosstabulation

Count

		Lwr GI		Total
		0	1	
Area_LG	1	95	135	230
	2	100	156	256
Total		195	291	486

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.253 ^a	1	.615	.644
Continuity Correction ^b	.169	1	.681	
Likelihood Ratio	.253	1	.615	.644
Fisher's Exact Test				.644
Linear-by-Linear Association	.253 ^c	1	.615	.644
N of Valid Cases	486			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.341	
Continuity Correction ^b		
Likelihood Ratio	.341	
Fisher's Exact Test	.341	
Linear-by-Linear Association	.341	.065
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 92.28.

b. Computed only for a 2x2 table

c. The standardized statistic is .503.

Crosstabs – All Gastrointestinal Organs

Area_AllGI * All_GI Crosstabulation

Count

		All GI		Total
		0	1	
Area_AllGI	1	215	151	366
	2	239	168	407
Total		454	319	773

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	.000 ^a	1	.995	1.000
Continuity Correction ^b	.000	1	1.000	
Likelihood Ratio	.000	1	.995	1.000
Fisher's Exact Test				1.000
Linear-by-Linear Association	.000 ^c	1	.995	1.000
N of Valid Cases	773			

Chi-Square Tests

	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.527	.058
Continuity Correction ^b		
Likelihood Ratio	.527	
Fisher's Exact Test	.527	
Linear-by-Linear Association	.527	
N of Valid Cases		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 151.04.

b. Computed only for a 2x2 table

c. The standardized statistic is .006.

APPENDIX L
RESPONSE TO USEPA COMMENTS ON DRAFT REPORT

RESPONSE TO EPA COMMENTS, DRAFT LIBBY SMALL MAMMAL DATA REPORT

This lists the responses to EPA comments and any changes to the final data report titled "Draft Data Report: Remedial Investigation, Operable Unit 3 of the Libby Asbestos Superfund Site, Phase III: Summer 2009 Small Mammal Data Collection Program" dated April 2010.

COMMENT: Section 3.5: The text refers to performing a "new" regression using Excel to estimate age from lens weight. This is not clear. The lens weights of animals captured in this study were converted to an estimate of age using the regression-based relationship of Miller and Iverson (1976). The text should be edited to present this approach more clearly.

- **RESPONSE:** While reviewing the text in Section 3.5 and Appendix J in response to this comment, we identified that an assumption was made regarding the age/lens weight relationship that was incorrect. The log-linear regression equation provided by Millar and Iverson (1976) was used directly in the revised calculations instead of a linear regression between lens weight and age. Consequently, the text in Section 3.5 is revised to more clearly explain the age estimation methods. The change in estimated ages is reflected in the Executive Summary, Section 4.3 Deer Mice Age, Table 4-5, Figure 4-1, Figure 4-2, and Appendix J3 and J4 (some of the animals were considerably older than originally estimated using the linear age/lens weight regression relationship used originally).

COMMENT: Section 4.5:

- a) Please bring forward from Appendix I the revised description of the lesions that were considered to be asbestos like

- **RESPONSE:** Agreed. We added the following text to bullet #3 in Section 3.7, "The modified definition refers to lesions that overlap those from asbestos causes, rather than lesions caused by asbestos."

- b) Please provide summary information on the occurrence of lesions that were assigned a pathos factor of 2, along with a summary of the pathologists final determination as to whether these lesions were asbestos related or not.

- **RESPONSE:** We added bullets to the end of the individual tissue results and discussion in Section 4.5 that summarized the asbestos-like lesions that were assigned a pathos factor of „2’.

- c) In the presentation of lesion score results, please present the data in a way that allows the contribution of multicellular parasite lesions to be distinguished from other lesions.

- **RESPONSE:** Figure 4-4 was changed to a stacked bar chart for the Reference and OU3 areas, where the lesions observed were separated into distinct categories. Bot fly and Capillaria lesions are not included in the animal scores shown on these figures since they were collected opportunistically and not evaluated systematically (animals with these lesions are footnoted). The pathologist could not discern "multicellular parasite lesions" from lesions caused by other inflammatory processes, so there is no category for multicellular parasite lesions indicated on Figure 4-4.

- d) Assuming that this document is intended to be a data summary report, it seems out of place to be presenting conclusions regarding the potential need for tissue burden analysis and/or for performing additional studies on other receptors (e.g., birds). EPA recommends that these conclusions be removed from this document, with those topics to be debated by the BTAG.

- **RESPONSE:** Agreed. Text was removed from the noted section, the Executive Summary and the Summary and Conclusions.

COMMENTS on Table 4-6

- a. **COMMENT:** Please check WRS calculations for 3 tissues where a pathos factor of 2 was assigned for one or more animals (left caudal lung, right caudal lung, post caval lung).
 - **RESPONSE:** Agreed. WRS calculations were checked and re-run with the final lesion score including the pathos factor for the four mice with those types of lesions. The new results are shown in Table 4-6.
 1. Three other lesion scoring errors by the histologist were identified and corrected: Larynx lesion score for Mouse R-A-5-1 should be „2‘, Rectum score for Mouse R-D-29-1 should be „2‘, and Ilium score for Mouse S-B-6-1 should be „2‘ (all 3 were previously reported as „1). WRS calculations on these tissues were re-run as well.
 2. These changes did not affect the significance of the differences in number of lesions observed in any of the tissues between OU3 and the reference area as reported in the draft report. Nor did the histologist’s conclusions change regarding a lack of attribution of any identified lesions to asbestos.
- b. **COMMENT:** Provide WRS results for several levels of tissue groupings intermediate between single tissues and the whole animal. This would include a) upper respiratory tract (larynx, trachea, mainstem bronchi), b) lower respiratory tract (all lung categories), c) all respiratory tract, d) upper GI (esophagus, cardiac stomach, fundus, pylorus), e) lower GI (duodenum, jejunum, ileum, cecum, colon, rectum, anus), and f) all GI.
 - **RESPONSE:** Agreed. The suggested six groups of tissues were created and compared between site and reference area with the WRS test and added to Table 4-6.
- c. **COMMENT:** Please provide 1-tail as well as 2-tail p values for the WRS results, where the 1-tail p values reflect the statistical significant of the site being greater than the reference area.
 - **RESPONSE:** Agreed. The 1-tail and 2-tail p-values for the all statistical results are provided in Tables 4-6 and 4-7, where the 1-tail p values reflect the statistical significant of the site being greater than the reference area.
- d. **COMMENT:** As specified in the Phase III SAP, please use a p-value of 0.2 rather than 0.05 for identifying tissues that might have higher lesion scores for site animals than reference animals. Because the Form I test specified in the Phase III SAP is 1-tailed (site is higher than reference), apply this criterion to the 1-tail p-values rather than the 2-tail values.
 - **RESPONSE:** Agreed. Tables 4-6 and 4-7, as well as the discussion in Section 4.5, have been changed to reflect a p-value of 0.20 for the determination of significant differences in lesions between OU3 and the reference area.
- e. **COMMENT:** Provide statistics (Fisher exact test) for the frequency of lesions (0 vs. > 0) for all tissues and groups in Table 4-6.
 - **RESPONSE:** Agreed. The Fisher exact test was run comparing the frequency of lesions for the reference area and OU3. The one- and two-tailed p-values for all tissues and groups were added to Table 4-6.

COMMENT: Appendix I, This report is well written and clear. However, the following expansions or clarifications would be useful:

1. Please include a more complete text description of the nature of the histologic lesions seen in larynx and left mainstem bronchus.
2. For the four lesions that were assigned a pathos factor of 2, please provide more detailed discussion as to why these were not considered to be caused by asbestos.
3. Please provide an explanation for why some fibrotic lung lesions were assigned a pathos factor of 2, and why some were not.
4. Please add text that describes the ability of the microscopic methods used to observe asbestos fibers of specific diameters and lengths, if they were present (this will help provide context for interpreting the observation that no fibers were detected).
5. Please expand the description of the general health status of the mice, and provide a discussion of the potential impacts (if any) of the observed lesions on growth, reproduction and survival of the mice.

■ **RESPONSE:** Agreed. These responses have been added as an addendum to the histology report in Appendix I prepared by Dr. Garner. Dr. Garner's responses follow:

1. There were no histologic changes in the larynx or left mainstem bronchus that differed from those seen in other portions of the respiratory tract. If there is a statistical difference regarding the lesions in these locations for control and study site mice, it cannot be explained histologically. The morphologic features of each lesion in each tissue, regarding type of lesions, cellular infiltrate, and severity, are listed in Appendix 1 in the original Northwest ZooPath report I prepared.
2. Individual tissues in the mammalian body are highly specialized structures, and they have only a limited number of ways to respond to any single disease process. There are very few diseases in nature that cause one specific tissue change that is diagnostic (pathognomonic) for that disease. Therefore, it is a spectrum of lesions that is documented for specific disease processes that aid in their diagnosis. Because many of the tissue reactions that occur with various disease processes tend to overlap, such as fibrosis or the formation of multinucleated cells (syncytia), the entire spectrum of lesions and their patterns in the tissue must be considered in proper context. It is my professional opinion that there is not an adequate spectrum of lesions or lesion patterns in these mice to document exposure to asbestos, and there is adequate evidence to attribute all disease processes in these mice to other causes. However, a pathos factor was included to address those lesions that overlap some of the lesions seen with asbestos.
3. I am not sure specifically which mice this comment pertains to. Some mice had pleural adhesions that are typically seen at the apex of the lung lobe of old mammals, a form of fibrosis associated with friction. It is considered an incidental finding and would not likely be assigned a pathos factor, but because it was there I included it in my report. Regarding pleural fibrosis and pathos, I tried to use this only when fibrosis was related to active disease processes, all of which in my opinion were due to parasite migration or foreign body migration.
4. Light microscopy, which I used, can resolve structures to approximately 1 micron in diameter. Asbestos fibers have varying configurations, but for the most part, the individual fibril component structure is spindle or spicule-shaped. Fibril size is variable as well and the diameter of some is beyond the level of the light microscope, or requires specialized microscopic techniques or microscopes to illustrate. Some asbestos fibers are refractile and birefringent, and some are not. Ancillary techniques using specialized microscopy, lung wash, and electron microscopy have been used to further determine the presence of asbestos in tissues. These procedures were beyond the scope of the study. It should be noted that aside from the absence of asbestos fibers in histologic sections in these mice, there also was no evidence of other forms of pneumoconiosis.

5. Although a broad spectrum of lesions were seen in various tissues of these mice, most of these lesions were mild, and attributed to parasitism. Parasite-host interactions evolve over time, and successful interactions beneficial to both species do not result in serious disease or death of either. Therefore, it was not surprising or unexpected that these mice, indigenous to their collection sites, were heavily parasitized but were in otherwise good health. All mice had recognizable or exuberant fat stores, indicative of adequate nutritional status. None of the mice had evidence of a prominent stress response in the lymphoid tissues or adrenals, and none of the mice had morphologic evidence of immune suppression or dysfunction, the latter based on morphologic features of the various lymphoid tissues (spleen, lymph node and thymus). The immune response (inflammation) in the tissues of the mice also supports a functional immune system that was able to contain the affects of parasite migration and foreign body insults. Although the true age of these mice was not known, they appeared to be adults and some had obvious age-related changes such as fibrosis. I would consider it unlikely that the lesions observed in the examined tissues would significantly alter general health status, growth or survival of the mice. The reproductive tracts were only examined opportunistically in these mice, and only a few female tracts were present, so evaluation was probably not statistically significant. These findings are listed in Appendix 2. It should be noted that all but one were histologically within normal limits. I consider it unlikely that these mice had compromised reproductive ability for any reason.